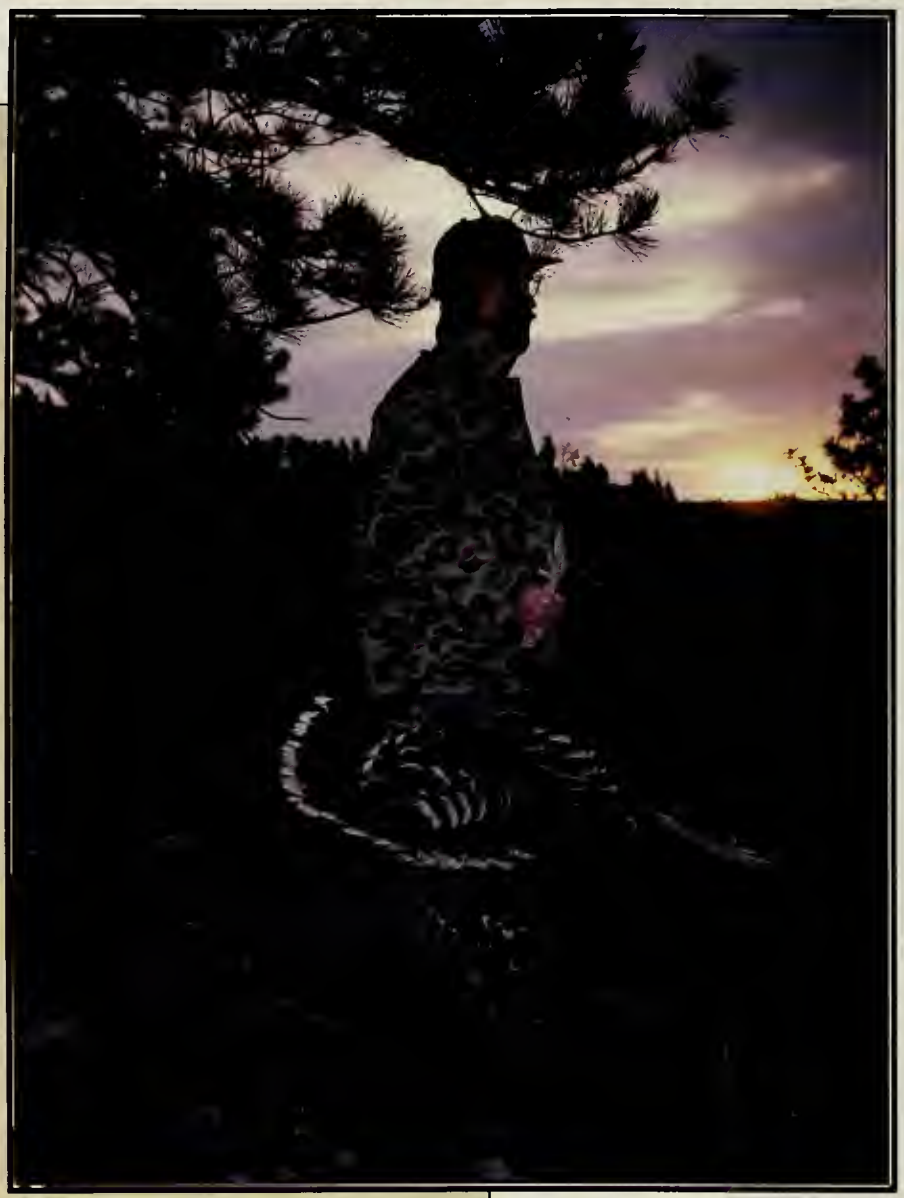
March/April 1991 $2.

MONTANA OUTDOORS

OUR POINT OF VIEW



STEVE GILBERT

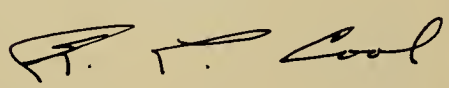
It wasn't too long ago—less than 40 years in fact—that hunting a turkey gobbler during the species' spring mating season never crossed a Montana hunter's mind. Neither did pursuing a bird on a crisp fall day in the hope of having it grace his holiday table. That's because the closest wild turkey inhabited a thick, wooded creek bottom somewhere beyond the state line.

That's right—less than four decades ago there were no wild turkeys in Montana. That's incredible when you consider that Montana now offers some of the finest turkey hunting in all the western states. Pursuing these wary birds has become one of the most cherished and challenging outdoor activities for many Big Sky sportsmen.

Historical records indicate that the Merriam's turkey (the subspecies now inhabiting portions of many western states) was not native to Montana. Yet from an initial transplant in 1954 of 13 birds from Colorado (five gobblers and eight hens) into suitable habitat near Lewistown, continually growing populations now draw over 8,000 Montana hunters afield annually. Ongoing trapping and transplanting efforts and the assistance of numerous private landowners are resulting in opportunities to hunt and observe the birds in new areas nearly every year.

Who deserves the applause for these new opportunities? If it weren't for the dollars sportsmen spend to purchase licenses, firearms, ammunition, and a multitude of other sporting paraphernalia, wild turkeys would not exist in Montana today. For that matter, neither would our large and healthy population of deer and elk and antelope. Sure, a few remnant individuals might roam the wilds, but not enough of a population to offer some of the finest, most liberal hunting opportunities and the most spectacular wildlife viewing opportunities on the North American continent. It's a fact that sportsmen have paid for the bountiful wildlife resource we all enjoy.

Spring gobbler season sets a hunter's year in motion. But it was the motion of sportsmen years ago that made this opportunity possible. If you're a hunter in search of a wily gobbler this spring, think about that and give yourself a pat on the back. You deserve it!



K.L. Cool

Director

Montana Department of Fish, Wildlife & Parks

Turn to page 27 for an article on Montana's bluebird success story.

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COVERS

Front Cover—The enthusiasm for turkeys—such as the one **Phil Farnes** captured—is growing. Expanding turkey populations in many parts of Montana are drawing more and more hunters to both spring and fall turkey hunting opportunities.

Back Cover—Bluebirds in the Big Sky are on an upswing. Catching sight of the dazzling bit of blue color—like that in **Raleigh Meade**'s photo—is a sign that spring has arrived.

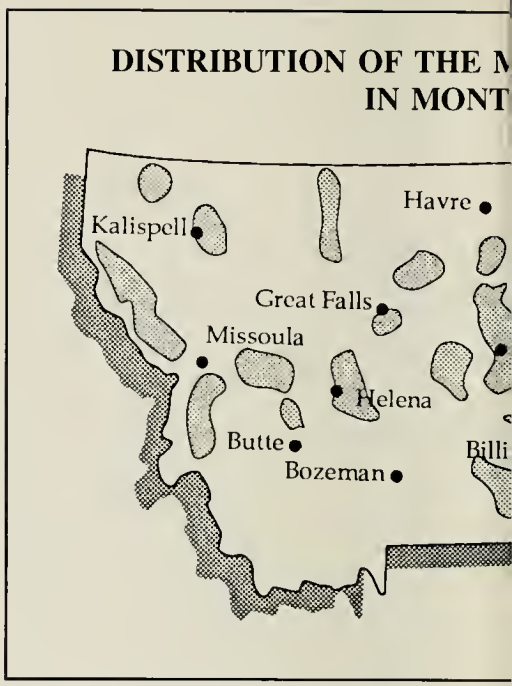
Merriam's on the Move

by Brian Giddings

Imagine a cool, crisp April morning just before the warming sun begins to break above the forested horizon. The steel of your shotgun feels ice-cold. Your camouflage clothing allows you to feel invisible in the forest. As you listen to the early morning sounds of songbirds, you suddenly hear a faint gobble-gobble-gobble off in the distance. Quickly, but quietly, you begin to move toward it. It is the opening day of spring turkey season.

Or, during an overcast November day, you shiver as the cold finally penetrates your hunting coat. But when you look ahead, you spot a maze of zigzagging tracks in the snow. Turkey tracks. Only 60 yards away, a flock of turkeys is feeding along a trail. Excitedly, you raise the .243 and fire at the largest bird. You examine the adult hen while placing your tag on her—this is quite a bonus to the day's deer hunt.

* * * * *



Merriam's turkeys, first introduced to Montana in 1954, are now present across much of the state.

Montana's wild turkey establishment effort and management program during the past 36 years have provided new and expanding turkey populations in many areas of the state. The tremendous success of this program has created a growing enthusiasm for both spring and fall turkey hunting opportunities and a heightened awareness of turkey populations across the state.

ESTABLISHMENT

Historically, the Merriam's wild turkey (*Meleagris gallopavo merriami*) was not found in Montana, but occupied the pine-oak forests of southwestern states such as Colorado and New Mexico. During the 1950s, several western states, including Montana, successfully introduced Merriam's turkeys.

On November 13, 1954, 13 wild-trapped birds from Colorado were released in the Judith Mountains near Lewistown. Then, between 1955 and 1957, three additional introductions were made in southeastern Montana with wild-trapped turkeys from Wyoming. Eighteen birds were released in the Long Pines area near Ekalaka, and 26 birds were released in two introductions in the Beaver Creek area near Ashland. Interestingly enough, these were the only Montana releases which used wild turkeys from out-of-state sources. These new turkey populations became well established and provided the source for additional release efforts in Montana.

During the next 30 years, the range of wild turkeys expanded through trapping and release efforts to include much of the state. The Long Pines, Roundup, and Pompeys Pillar areas provided the source for the majority of the releases. Huntable populations currently exist across much of Montana, although the largest populations inhabit southeastern Montana.

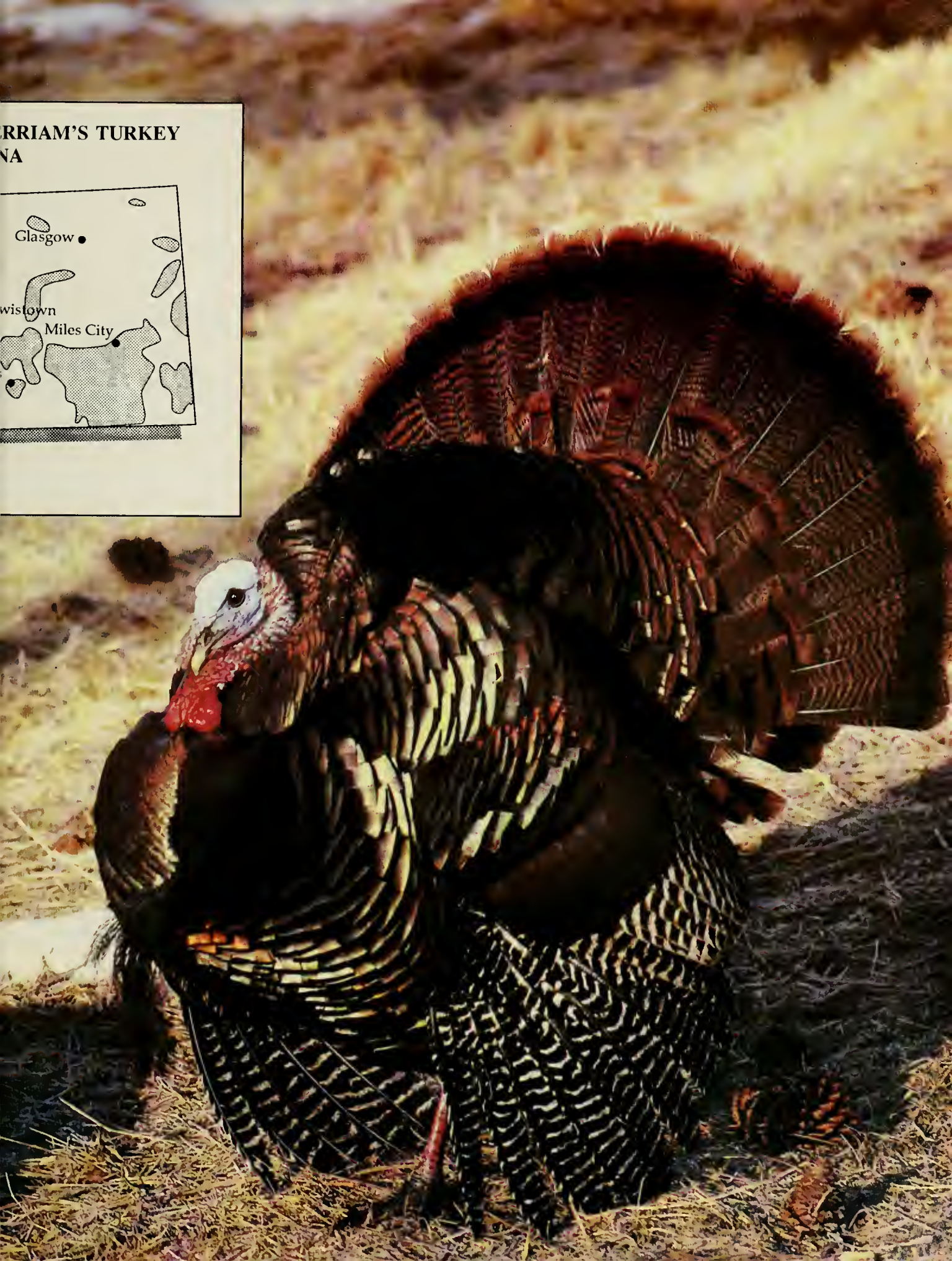
Most successful wild turkey populations have been established in semi-open ponderosa pine forests with rugged terrain. Approximately half of these forested areas consist of grass, deciduous trees, and brush in scattered meadows or small openings and along creek drainages. This type of habitat is especially abundant in the Custer National Forest in southeastern Montana and the Bull Mountains in the south central part of the state. Similar habitats support turkey populations along the Missouri River breaks in eastern Montana, the Judith, Snowy, and Little Belt Mountains in central Montana, and to a lesser extent the Lolo, Flathead, and Kootenai National forests in western Montana.

Wild turkey populations are also now present along Montana's major river valleys, where habitat components include cottonwood trees, brush, and meadows or agricultural fields scattered throughout valley bottoms. Portions of the Missouri, Yellowstone, Bitterroot, Flathead, and Clark Fork river valleys support these successful and expanding wild turkey populations.

MANAGEMENT

Management of the Merriam's turkey revolves around the bird's high reproductive potential, its high natural mortality rate, and availability of suitable habitat. With this knowledge of turkey biology, wildlife managers can manage turkeys by providing as much hunting

DAVE BENNETT


RRIAM'S TURKEY
NA
Glasgow
wistown
Miles City

TURKEY TRAPPING AND TRANSPLANTING

Year Released	Release Area	Source Area	Toms	Hens	Total
1954	Judith Mountains, Lewistown	Colorado	5	8	13
1955	Long Pines, Ekalaka	Wyoming	5	13	18
1956	Beaver Creek, Ashland	Wyoming			26
1957	Slippery Ann, Fort Peck Game Range	Long Pines	3	13	16
1957	Sarpy Creek, Hysham	Long Pines	2	15	17
1957	Musselshell Breaks, Jordan	Long Pines	9	15	24
1957	Knowlton Area, Miles City	Long Pines	5	14	19
1958	Pine Hills, Miles City	Long Pines	3	4	7
1958	Big Gulch, Florence	Long Pines	8	9	17
1958	Bull Mountains, Roundup	Long Pines	24	29	53
1958	Ekalaka Hills, Ekalaka	Long Pines	2	11	13
1958	Little Belts, Raynesford	Long Pines	6	13	19
1959	Hilger Ranch, Helena	Long Pines	6	16	22
1959	Lynch Creek, Plains	Long Pines	5	13	18
1960	Judith River, Winifred	Fort Peck Game Range	4	11	15
1960	Larb Hills, Glasgow	Fort Peck Game Range	2	10	12
1962	Judith Game Range, Utica	Musselshell Breaks	8	8	16
1963	Bear Paw Mountains, Big Sandy	Judith Mountains	3	16	19
1963	Shane Creek, Columbus	Judith Mountains	2	18	20
1964	Spokane Hills, Helena	Winifred	10	16	26
1964	North Moccasin Mountains, Lewistown	Winifred	8	11	19
1964	Clancy Area, Helena	Winifred	8	12	20
1964	Southeast of Columbus	Columbus	3	4	7
1964	Tobacco River, Rexford	Roundup	10	17	27
1964	East of Superior	Roundup		4	4
1965	Sieben Ranch, Helena	Roundup	5	8	13
1965	Pine Hills, Pompey's Pillar	Roundup		10	10
1965	Bitterroot Game Range, Corvallis	Roundup		9	9
1966	N-Bar Ranch, Lewistown	Roundup	13	7	20
1966	Pine Hills, Pompey's Pillar	Roundup	9	5	14
1967	Pines Area, Glasgow	Roundup	7	9	16
1967	McCartney Mountain, Glen	Roundup	5	20	25
1968	Bangtail Area, Livingston	Fort Peck Game Range	3	17	20
1969	Roy Area	Fort Peck Game Range	2	5	7
1969	Grassrange	Fort Peck Game Range	1	5	6
1969	Park City Area	Roundup	5	12	17
1969	Ryegate Area	Roundup	2		2
1972	West of Thompson Falls	S. of Pompey's Pillar	6	16	22
1972	Judith Game Range, Utica	S. of Pompey's Pillar	10	27	37
1972	Three Mile Game Range, Florence	S. of Pompey's Pillar	9	16	25
1972	Zortman Area	S. of Pompey's Pillar	5	20	25
1972	West of Livingston	S. of Pompey's Pillar	4	10	14
1972	Sun River Game Range, Augusta	S. of Pompey's Pillar	4	19	23
1974	Beartooth Game Range, Wolf Creek	S. of Pompey's Pillar	12	16	28
1974	Beartooth Game Range, Wolf Creek	S. of Pompey's Pillar	1	16	17
1975	Little Rockies, Zortman	S. of Pompey's Pillar	20	9	29

GREG RISDAHL

Trapping is done during winter when turkeys are concentrated in large flocks. The accompanying table shows where

opportunity as possible to remove each year's surplus of birds. During an early study in the Long Pines area, researchers discovered that an introduced flock of 18 birds increased to an estimated 700 turkeys in only three years. And almost 1,500 turkeys were removed by hunting and trapping during the next eight years.

Because 50% to 70% of the turkeys in a population die each year from natural causes, management by hunting will replace this mortality with birds in the bag during hunting seasons. As turkeys continue to fill available habitat, hunting opportunities will continue to increase.

Hunting seasons are structured to maximize recreational opportunity for sportsmen. Spring gobbler-only seasons occur during the turkey breeding season to provide the opportunity to harvest surplus males from the population. Turkeys are polygamous, therefore dominant males acquire a harem of hens and do most of the breeding. The consequence is a surplus of males each season.

Fall either-sex turkey seasons are designed to provide the most opportunity since a greater number of sportsmen take advantage of the fall season. A large number of poults (first-year birds), which make up the majority of the annual population, also provide more harvest opportunity during the fall season.

Maintaining habitats currently supporting turkeys is considered essential to management, as is identifying suitable unoccupied habitats. Stands of semi-open ponderosa pine with good ground cover or similar habitat components must be available. Wild turkeys require

turkeys have been captured and released in Montana over the past 35 years.

TURKEY TRAPPING AND TRANSPLANTING

Year Released	Release Area	Source Area	Toms	Hens	Total
1975	Judith Game Range, Utica	S. of Pompey's Pillar	9	16	25
1978	Beartooth Game Range, Wolf Creek	Volborg		34	34
1978	Northeast of Fort Benton	S. of Pompey's Pillar		22	22
1978	Three Mile Game Range, Florence	S. of Pompey's Pillar		32	32
1978	Beartooth Game Range, Wolf Creek	Volborg	10		10
1978	Three Mile Game Range, Florence	Volborg	5	9	14
1978	Northeast of Fort Benton	Beartooth Game Range	3		3
1981	Big Coulee, Rapelje	Big Snowy Mountains	6	24	30
1981	Haymaker Game Range, Harlowton	Big Snowy Mountains	6	8	14
1981	Aunt Molly's WMA, Ovando	S. of Pompey's Pillar	5	8	13
1982	Taylor Ranch, Helmville	S. of Pompey's Pillar	6	6	12
1982	Nevada Cr. Res., Helmville	S. of Pompey's Pillar	5	13	18
1983	Dagmar Area	S. of Pompey's Pillar	4	8	12
1983	Sula Ranger Station, Sula	S. of Pompey's Pillar	5	3	8
1983	Judith River, Winifred	S. of Pompey's Pillar	10	18	28
1983	Nevada Cr., Helmville	S. of Pompey's Pillar	2	20	22
1983	Brock Cr., Garrison	S. of Pompey's Pillar	13	15	28
1983	Rohrer Ranch, Helmville	S. of Pompey's Pillar	9	23	32
1984	Hepner & Metolius areas, Oregon	S. of Pompey's Pillar	3	21	24
1984	Hepner & Metolius areas, Oregon	S. of Pompey's Pillar		24	24
1984	Rookery WMA, Havre	S. of Pompey's Pillar	10	20	30
1984	Eagle's Nest, Scobey	S. of Pompey's Pillar	7	15	22
1984	Prison Ranch, Deer Lodge	S. of Pompey's Pillar	14		14
1985	Prison Ranch, Deer Lodge	S. of Pompey's Pillar		14	14
1985	Fort Peck	S. of Musselshell		15	15
1985	Marias River, Valier	S. of Musselshell		9	9
1985	Fort Peck	S. of Pompey's Pillar	10		10
1985	Marias River, Valier	S. of Pompey's Pillar	7		7
1985	Little Belt Mountains, Harlowton	Roundup			11
1988	Little Belt Mountains, Harlowton	Roundup	1	20	21
1988	Reedpoint Area	Roundup	6	14	20
1988	Southeast of Columbus	Roundup	6	30	36
1988	Reedpoint Area	Roundup	1	1	2
1988	Missouri River, Culbertson	Roundup	8	21	29
1988	Missouri River, Culbertson	Roundup	2	16	18
1988	Eureka Area	Clark Fork River	12		12
1988	Eureka Area	Clark Fork River	14	9	23
1989	Little Belt Mountains, Harlowton	Roundup	11	12	23
1989	Belfry Area	Roundup	7	28	35
1989	Reedpoint Area	Roundup	5	14	19
1989	Southeast of Columbus	Roundup		12	12
1989	Missouri River, Culbertson	Broadus	31	34	65
1989	Milk River WMA, Saco	Broadus	5	29	34
1989	Isaac Homestead WMA, Hysham	Ekalaka	10	19	29
1989	Southwest of Reedpoint	Roundup	4	17	21
1989	North of Greycliff	Roundup	6	15	21

roosting sites, escape cover, loafing areas, nest sites, and dependable food sources. Part of the department's management program relies on monitoring habitat conditions as they change and determining how changes will influence wild turkey populations.

Recent research into the effects of logging and wildfire on the Merriam's turkey illustrates this effort. During 1988, a cooperative project between the Department of Fish, Wildlife and Parks (FW&P), the Custer National Forest, the National Wild Turkey Federation, and Montana State University was initiated in the Long Pines and Ekalaka Hills area of southeastern Montana.
The study area consists of federal, state, and private lands, where timber is harvested on portions of the Custer National Forest and a major fire in 1988 burned 51,750 acres of forest land and 6,520 acres of private land.

During the four-year study, researchers will monitor radio-instrumented turkeys to examine flock size, nest site selection, spring dispersal, brood habitat use, mortality factors, food habits, population trends, and seasonal habitat preferences in relation to changing environmental conditions. Study findings will be compared with those from a 1961-63 study of the same area, and should be helpful in the ongoing management of the Merriam's turkey in Montana.

Wildlife managers use trapping and transplanting as tools to establish new populations, supplement new but poorly established populations, and relocate birds causing agricultural damage. Trapping is done during winter when turkeys congregate and form large

WHEN, WHERE, AND HOW TO HUNT

Montana has a gobbler-only spring season and an either-sex fall season. The spring season generally runs from mid-April through mid-May. The fall season typically begins with the upland game bird season in early September and ends with the closing of big game season in late November. Resident and non-resident hunters are required to purchase a turkey license in addition to an upland bird and conservation license. In some areas of the state, a special permit is required in addition to a turkey license. Hunters are allowed one wild turkey per license per season—i.e., one in the spring and one in the fall. Specific information on season dates, open and closed areas, special permit application deadlines, and other information on restrictions can be obtained from the spring and fall turkey hunting regulations or from any Fish, Wildlife & Parks regional office.

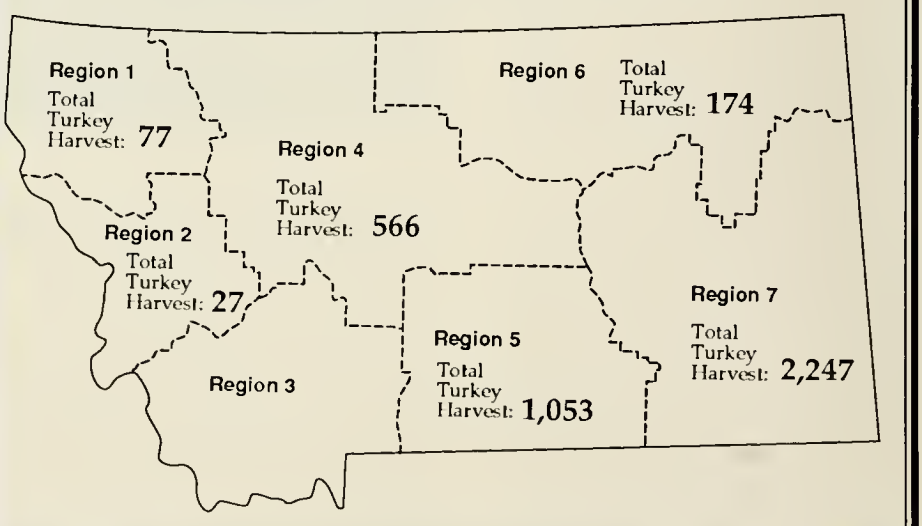
Ken Walcheck, the department's information officer in Miles City, has written a turkey hunting guide, "Hunting the Merriam's Turkey in Montana (Spring Hunting Emphasis)." This booklet provides valuable information on how to become a successful turkey hunter. Walcheck describes the wild turkey's physical and sensory abilities and covers turkey calling, hunting strategies and tactics, and general tips. You can obtain a free copy of this guide and a free turkey shotgun pattern target by contacting him at the Montana Department of Fish, Wildlife & Parks, Route I, P.O. Box 2004; Miles City, MT 5930l.

Finding a place to hunt turkeys should not present a problem. Turkeys are found on U.S. Forest Service and Bureau of Land Management lands, as well as on private land. Popular hunting areas include the Long Pines and Ashland areas of the Custer National Forest and portions of Fergus County and the Charles M. Russell National Wildlife Refuge along the Missouri River breaks.—*Brian Giddings*

BRIAN GIDDINGS

Calling a tom within shotgun range during the spring season takes patience and skill.

1989 TURKEY HARVEST BY FISH, WILDLIFE & PARKS REGIONS



flocks. These flocks often converge on private land in farmyards or stockyards which provide easy access to trap sites. Captured turkeys are removed from the nets, individually placed in burlap bags or cardboard turkey boxes, and transported to new locations. The specially constructed turkey boxes have been donated to FW&P by the National Wild Turkey Federation (see sidebar). Most of the primary turkey habitat in Montana has now been stocked with turkeys, although some islands of available habitat still exist.

HUNTING AND HARVEST

Wild turkeys have been hunted in Montana since 1958, and a turkey tag has been required since 1959. The first spring gobbler-only seasons were instituted in 1962. Seasons have varied from a three-day fall season in a restricted area in 1958 to a 23-day spring and 86-day fall season in a 13-county area in 1990. Spring gobbler-only seasons are now conducted in six FW&P administrative regions, while fall either-sex seasons are held in five.

The statewide Merriam's turkey harvest has increased gradually from 89 birds in 1958 to 4,173 in 1989. Also, the statewide success rate for turkey hunters has increased from 19% in 1958 to 54% in 1989. The chances of bagging a wild turkey in Montana today are the best they have been in 31 years. Counties that provide the bulk of the turkey harvest include Fergus, Bighorn, Musselshell, and Yellowstone in central Montana, and Richland, Carter, Custer, Powder River, and Rosebud in eastern Montana.

APRIL GOBBLERS

Wild turkeys are extremely wary and possess keen color vision and good hearing. Bagging a spring gobbler requires knowledge of turkey behavior and a high degree of skill. Turkeys can be hunted with shotguns or rifles, but since most hunters prefer to call them within shotgun range during the spring season, the following discussion pertains to shotgun hunting.

Scouting for turkey sign is the best way to locate a good hunting area. Look for roost trees, droppings, feathers, and scratching or dusting areas. Turkeys prefer to roost in tall, dead ponderosa pines sheltered from high winds.

Another method is to use a "locator" call, such as an owl hooter or crow call, during late evening to get roosted birds to respond. Once a tom is located, you can sneak into calling position early the next morning before the turkeys have left the roost.

If you don't have a bird located, you still stand a good chance of success by simply being in the turkey woods before sunrise on a clear, calm morning and listening for the toms to begin gobbling. Under optimum conditions you'll be able to hear a gobbler more than half a mile away. Once you've pinpointed the bird's location, try to sneak within about 200 yards of him. Get uphill and on the same ridge as the gobbler if you can, since toms are reluctant to cross deep ravines or negotiate heavy cover to reach a yelping hen. Choose a place to call from that offers some concealment, but that will provide a clear view of an approaching bird.

Most hunters prefer to wear camouflage, but any clothing that blends with the surroundings will work. Some hunters use camo paint or headnets, camo gloves, and camo tape on their shotguns, while others just rely on keeping absolutely still to avoid being seen. The latter feel that sudden movement spooks more turkeys than anything else.

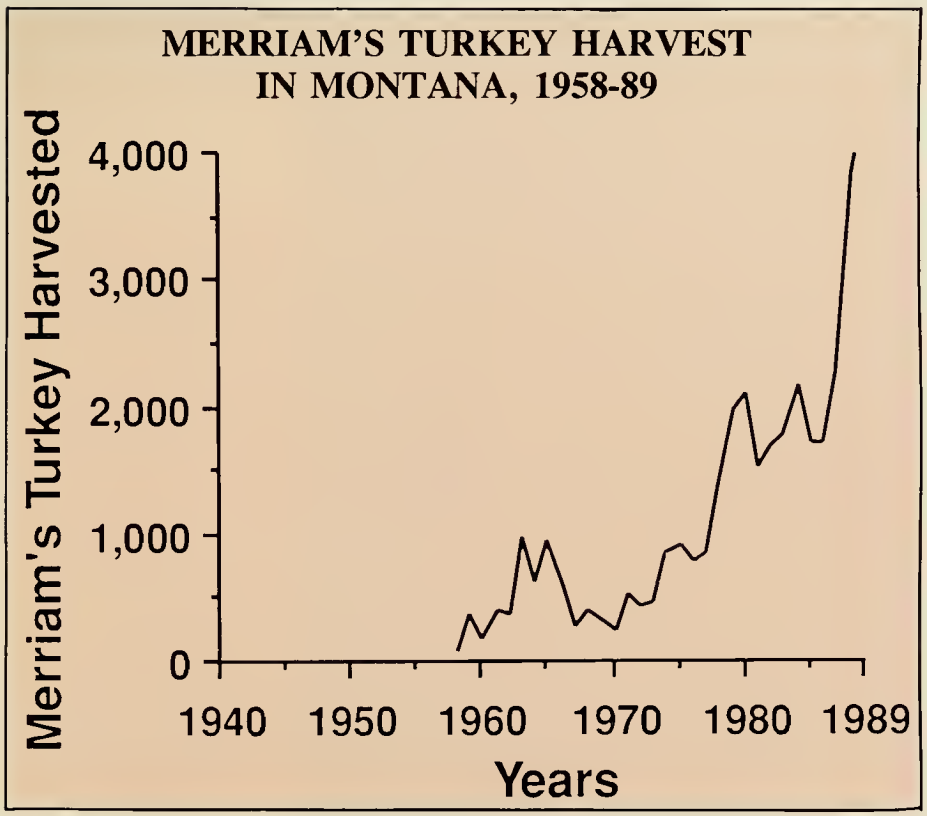
Weather can be critical in dictating the success or failure of a spring gobbler hunt. Cold, windy days spell trouble, since toms tend to gobble less and certainly can't be heard as far away. Conversely, a clear spring morning after several days of bad weather is an excellent time to be in the turkey woods; toms almost seem to be making up for lost time on such days.

CALLING TURKEYS

Calls differ widely in type, size, tone, and ease of operation, and each expert turkey hunter has his own opinion. One of the most popular and easiest to use is the hinged box with lid. Drawing the lid across the beveled edge of the box with the correct pressure and speed produces a convincing hen yelp.

Another popular calling device is the mouth or diaphragm call. This small, horseshoe-shaped piece of metal or plastic covered with a diaphragm of thin rubber is harder to learn to use but has the advantage of not requiring your hands to operate.

Concentrate on learning to imitate the



hen yelps and clucks, since these are the two most important calls. The rhythm of the yelping sequence is more important than the tone, and this is what you should try to perfect when calling. Surprisingly enough, some hens will produce yelps that are really off key. Probably the best way to learn the yelping sequence of the hen turkey is to listen to a good caller or to an instructional tape.

Under the right circumstances, gobblers will respond readily to a call. Other times, they can be quite indifferent. A wise old tom who has hens nearby may be difficult to separate from his harem. On the other hand, a young tom (jake) with no harem of his own may come to you on the run. When a bird gobbles a time or two in response to your hen yelp, it's best to remain quiet for a while. You can be sure he knows where you are, and will begin to move in your direction if he's so inclined. If a bird continues to answer your call but "hangs up" out of gun range, try quietly moving to another location about 50 yards away and yelping again. If a tom simply refuses to respond, it's probably best to leave him alone and try again another day.

Turkeys are big birds with a heavy coat of protective feathers, so shots should be taken only at birds well within shotgun range (less than 40 yards). The best strategy is to use a full-choke shotgun loaded with buffered No. 2, No. 4, or No. 6 shot and aim for the turkey's head.

As in any type of hunting, you should never shoot until you've fully identified your target. Also, never assume that the gobble you hear has been made by a turkey—it may be another hunter with a gobbler call. Trying to stalk a gobbling turkey is risky business, since you may be sneaking up on another hunter. It's far more effective—and safer—to call the gobbler to you.

SEX AND AGE IDENTIFICATION

The mature gobbler's red, white, and blue head adornments and beard—the hairlike appendage hanging from the upper breast—serve as good field marks in distinguishing the male from the female. However, up to 10% of hens possess beards, and the gobbler's head adornments are not readily visible until his second year. The only sure way to tell a gobbler from a hen is to examine the lower breast feathers. The tips are glossy black in males and white or buffy in females.

The outer two wing feathers will tell you whether the bird is a juvenile or an adult. If the feathers are sharply pointed and without transverse white bars extending to the tip, the bird is a poult, or bird of the year. If the outer feather tips are somewhat rounded, and the white bars extend to the tip, the bird is an adult. To tell the difference between an adult gobbler and a first-year jake, examine the central two pairs of tail feathers. In an adult the two pairs will be the same length as the other tail feathers, while in a jake these two pairs will be longer than the others.

OTHER CHARACTERISTICS

A more experienced turkey hunter and friend once told me during a spring gobbler hunt that bagging any turkey is truly a prize. However, specific characteristics could distinguish your bird from the rest. These might include weight, spur length, beard length, and unusual characteristics such as multiple beards, double spurs, or a bearded hen.

Since 1982 the National Wild Turkey Federation has maintained a register for all the wild turkey subspecies hunted in North America (eastern, Rio Grande, Merriam's, Florida, Mexican, and ocellated). A U.S. wild turkey "grand slam" includes the eastern, Florida, Merriam's, and Rio Grande subspecies.

THE FUTURE

The future of the Merriam's turkey in Montana is bright. As its range continues to expand, hunting opportunities will increase. As long as sportsmen continue to support turkey management and habitat conservation, the Merriam's turkey will remain a permanent wildlife resource in the Big Sky state.■

About the NWTF...

The National Wild Turkey Federation (NWTF) was founded in 1973 as a non-profit organization dedicated to the conservation and management of the wild turkey and its habitat. With over 60,000 members representing 50 states, the NWTF has grown into a major conservation organization.

In 1985, the NWTF developed the Wild Turkey Super Fund to pool money from participating chapters into individual state funds administered jointly by the NWTF, the chapters, and state wildlife agencies. Over $3 million has been deposited in the fund, and over $2.3 million spent since 1985 on habitat improvement, hunter safety, land acquisition, and wild turkey restoration. In addition, $750,000 has been raised and spent on research of the wild turkey and its habitat and other projects of national significance.

In Montana, the NWTF has provided specially designed wild turkey transport boxes to the Montana Department of Fish, Wildlife & Parks (FW&P) to aid in the department's program to expand the range of the wild turkey. The federation is also involved in a three-way partnership with the Custer National Forest and FW&P to fund research on the effects of fire and logging on wild turkey habitat in southeastern Montana. For more information on the NWTF, call 803/637-3106, or write NWTF, P.O. Box 530; Edgefield, SC 29824.

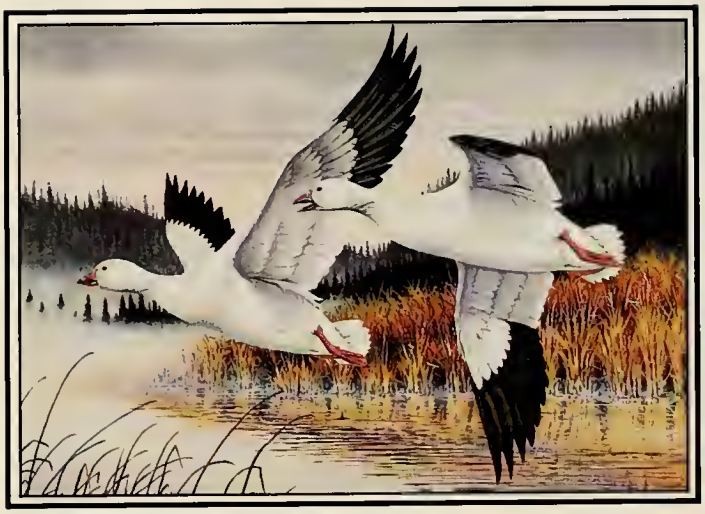
A Montana state chapter has recently been formed. For information, contact Harvey Rattey, 1460 Bear Canyon Road; Bozeman, MT 59715 (406/587-1028.)–*John M. Edwards, national coordinator, "Making Tracks" Program, National Wild Turkey Federation*

Thornbrugh "Three-Peats" as Waterfowl Stamp Winner

by William Phippen

Joe Thornbrugh of Victor is three for six in Montana's waterfowl stamp competition. Thornbrugh's painting, "Mission Mountain Snows," was selected for reproduction as Montana's 1991 waterfowl stamp. Thornbrugh paintings were also selected for reproduction as the stamp in 1986, the first year of the competition, and last year.

The artist's 1991 submission, depicting several snow geese winging above the snow-capped Mission Mountains, was selected from 26 works submitted to the competition. Other winners included: **Craig Phillips**, Thompson Falls, second; **Roger Cruwys**, Bozeman, third; **Robert Kercher**, Great



SECOND PLACE
Craig Phillips, Thompson Falls, MT

THIRD PLACE
Roger Cruwys, Bozeman, MT

FOURTH PLACE
Robert Kercher, Great Falls, MT

HONORABLE MENTION
Ron Jenkins, Missoula, MT

Falls, fourth; and **Ron Jenkins**, Missoula, honorable mention. All finalists' paintings will be exhibited throughout the state in the coming months.

Thornbrugh's paintings reflect the painstaking research he undertakes before his subject ever begins to emerge on a canvas. His paintings also reflect his life-long interest in wildlife, particularly birds, his favorite artistic subject.

Thornbrugh's works have been exhibited at the Los Angeles County Museum of Natural History, the National Wildlife Federation headquarters in Vienna, Virginia, the Museum of Native American Cultures in Spokane, the Leigh Yawkey Woodson Art Museum in Wausau, Wisconsin, the Charles and Emma Frye Museum in Seattle, and at the 1979 and 1980 National Bird Art exhibitions. In 1980, his painting of a ring-necked pheasant was selected for exhibition in the National Collection of Fine Arts at the Smithsonian Institution in Washington, D.C.

Since 1986, hunters have been required to possess a state waterfowl stamp as well as a federal "duck stamp" to hunt waterfowl in Montana. As they have in the past, funds generated through sale of the $5 stamps, a series of limited edition prints, and related items will be used to finance projects that conserve and enhance waterfowl habitat throughout Montana.

Prints of the 1991 stamp can be ordered through most art galleries in the state.■

Eye the Eagle

Eye the Eagle on your state tax form and give to Montana's Nongame Wildlife Program.

This year you will find something intriguing among the lines and boxes on your Montana state tax form. Just eye the eagle that seems to swoop down from one particular box—that's the box where you can personally help many of Montana's watchable wildlife species. Your tax-deductible contribution goes directly to the state's Nongame Wildlife Program.

What are Montana's nongame wildlife species? They are some of the most highly watchable of our wildlife species. The eagles and hawks we look for perched in trees or soaring above rivers are nongame species. The birds at our backyard feeders—chickadees, sparrows, nuthatches, finches, and more—are nongame species. Throughout Montana, there are more than 500 species of wildlife and fish that depend on our support each year at tax time.

The Montana Department of Fish, Wildlife & Parks has responsibility for managing the state's wildlife and fish species, a tremendous task when you consider the size of Montana—147,000 square miles. The nongame check-off provides a great opportunity for Montanans to assist all wildlife, specifically those not fished for or hunted. That's 80% of all Montana's wildlife and fish species.

What does the Nongame Wildlife Program do for you? A high priority of the program is to help Montanans better appreciate and enjoy the diversity of wildlife surrounding them. The Nongame Wildlife Program has broadened its efforts over the past year to inform people about the wonders of nongame through "Montana's Watchable Wildlife."

Watchable wildlife refers to the activity of observing or photographing wildlife in its natural habitat, including backyards. Voluntary contributions to the check-off allowed FW&P to contribute information to the 1990 "Montana Wildlife Viewing Guide," to produce a brochure on Montana's bald eagle gatherings, and to give people details about watchable wildlife through a display, slide show, new logo, and a loon poster by Missoula artist Monte Dolack.

Watching wildlife provides an excellent chance to learn about nature's complexity. Nature trails, interpretive signs, and backyard habitat kits are the kinds of accompanying information that can make watching wildlife even more meaningful. With proper funding and public involvement, Montana's Watchable Wildlife Program will be able to provide more of these educational services.

When we learn about the roles of various wildlife species, we realize how important it is to conserve all species and their habitats. Consider this: Wildlife biologists counted 172 species of birds—from hummingbirds to hawks—feeding on an invasion of Rocky Mountain locusts in Nebraska. Birds play a key role in reducing insect outbreaks. However, we are still discovering the roles of many birds and other nongame species in the natural world. The other priority of the nongame program is to conduct critical inventories (research and monitoring of nongame species to make sure they will continue to enrich our world).

To better understand and conserve watchable wildlife species will take commitment from many Montanans. The Nongame Wildlife Program needs your help every year at tax time. Remember that your contribution is tax-deductible. And if you turn your taxes over to a tax accountant, please tell your preparer that you want to check off for wildlife.

It's simple. Just eye the eagle.—*Deborah Richie, nongame information specialist, Conservation Education Division, Helena*

Eagles and Viewers At Canyon Ferry

Standing in the December wind, I draw my chin inside my collar and exhale, trying to break the constant chill breezing through my coat. Layers of clothes, boots, gloves, and hat are just shields attempting to protect a sedentary shell. I need to keep warm, keep walking. At Riverside Campground just below Canyon Ferry Dam not far from Helena, the sport I am pursuing is a spectator sport demanding the discipline of observation. A gathering of eagles approximately 300 yards downstream would stop any viewer in his or her tracks.

With binoculars raised, I hold my breath and try to quiet a shiver. There in my scope I focus on a dark span of wing. Close to the water, practically

skimming the surface, glides a mature bald eagle. The sight leaves me still.

Someone on my left, who may have her sights on the same bird remarks, "There's a mature! You don't realize how big they are 'til they fly by a tree. Wow, they're something else!"

I nod in agreement but keep my attention directed forward. I try to follow the eagle as it sweeps up the shoreline and mazes its way through the trees, but I catch a glimpse of white and my binoculars rest on a lone, tree-

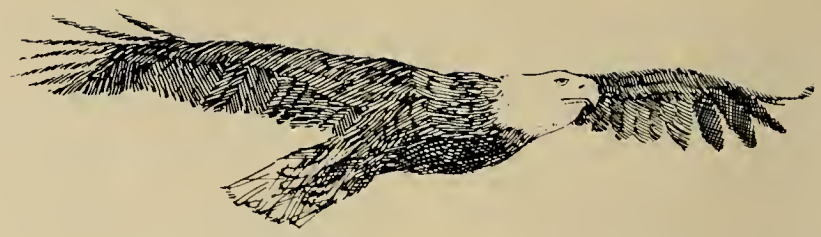
perched bald. Regal and statuesque, its aura is commanding. For a few minutes I observe him, but his patience outlasts mine, and I lower my binoculars. I need to keep moving. I walk to a group of viewers and linger on the outskirts of their conversation.

News briefs announcing Montana's eagle gathering appeared in the Chicago Tribune, the New York Times, and other major publications. Many people decided to take advantage of the viewing opportunity and headed to Montana. I listened to one man from Connecticut tell his story.

"I was kind of skeptical," he laughed. "My cousin read about it in the New York Times, and said 'Let's go!' So we came out and the first bird we saw was a sea gull. I turned to my cousin and said, 'You did say *eagle* didn't you?' "

Other comments surfaced as people exchanged stories of how they learned about the eagle gathering. Another spectator who hailed from the East Coast quoted a friend as saying, "I didn't know the Eagles got back together...and why go all the way out to Montana to see them?"

Well, there were no promises for



reunions of musical groups, but hundreds of Canadian eagles were indeed back together this fall in Montana, feeding at spawning kokanee salmon runs throughout western regions of the state. Although there were a few isolated viewing areas, the most abundant gathering during November and early December was northeast of Helena at Canyon Ferry. The peak of the run was Thanksgiving weekend when approximately 256 bald eagles were counted between Canyon Ferry Dam and Holter Lake.

As the eagles paid tribute to the kokanee, flocks of viewers sporting binoculars and high-powered zoom lenses paid tribute to the eagle. License plate surveys revealed spectators from Massachusetts, Connecticut, Nebraska, Iowa, Colorado, California, Texas, Louisiana, Wyoming, and Alberta.

The spectators' appreciation for the eagle gathering was largely influenced by any one of 30 FW&P volunteers who answered questions and provided helpful bits of knowledge about the eagles.

Volunteer Debby Huigen said the question she answered most was, "Do eagles eat dead fish?" to which she was quick to respond, "Our national symbol is not a finicky eater!" She added, "From what I can tell, they eat until 10 o'clock, hassle neighbors from 10 to 10:30, and soar from then on!"

At noon, the northern sky above a far ridge became spotted with eagles in flight. At first the sight was well received until a naturalist informed the crowd that it was a sign of a disturbance. "They're losing energy," he remarked, "and this can result in lower energy levels and ultimately in demise somewhere in the season." He explained that the eagles need to maintain a delicate balance between food and flight, and when they are disturbed, they are working harder than they should be.

"It was O'Hare there for a moment," one woman remarked. "They were just coming and going."

Another FW&P volunteer, Mavis Galawe, estimated that 600 people and 200 cars a day ventured to the Riverside Campground during the height of the eagle gathering. Proceeds from a $2-per-car fee went directly to maintenance of state parks.

After four hours of battling the cold, but finding it difficult to leave the experience behind, I finally retreated to my car. The drive along the Canyon Ferry Road carried me back to Helena, but my thoughts stayed behind. The experience of the morning—the eagles, the people, the December chill—left me with impressions. And I, along with the many others who were privileged to witness the gathering of eagles this fall, stepped away, knowing we had experienced a unique and wonderful beauty.—*Bridget E. Moylan, intern, Conservation Education Division, Helena*

Governor Stephens Names Two New Commissioners

Governor Stan Stephens appointed Glasgow attorney Jim Rector and Sweetgrass County Commissioner Elaine Allestad to the Montana Fish and Game Commission.

Allestad is the commission's first female member. She has been a county commissioner since 1985 when she was appointed to the post. She was elected to a six-year term in 1987. She and her husband operate a sheep ranch near Big Timber.

Rector is chairman of the newly formed Valley County Sportsmen Club. He has been active in local chapters of Walleyes Unlimited and Ducks Unlimited.

Allestad and Rector took office in January, replacing Robert Jensen of Circle and F.W. "Bill" Howell of West Yellowstone. Their terms will run until January 1, 1995.

In announcing the appointments, Gov. Stephens praised the work of Jensen and Howell. He said Jensen, the McCone County sheriff, provided ideas

Elaine Allestad

Jim Rector

for improving enforcement of fish and game laws, and Howell had been a strong advocate for recreationists.

Wildlife Film Festival Set for April

Award-winning films in the 14th annual International Wildlife Film Festival (IWFF) in Missoula will be shown April 4-7 at the Wilma Theater. The IWFF is the largest and longest-running festival of its kind. The philosophy that governs the festival is conservation through communication.

Dr. Charles Jonkel of Missoula initiated the IWFF in 1976 as he saw natural habitat being developed with little concern for the species it affected and the future impact such development would have on wildlife. Also, many wildlife films in the 1960s and early '70s created misconceptions about wildlife with simplistic and often inaccurate portrayals.

Through the IWFF, film makers were encouraged to compose wildlife footage both artistically pleasing and scientifically correct. Consequently, the IWFF has helped bring wildlife films to a more truthful and accurate level.

For additional information, contact: International Wildlife Film Festival, 280 East Front Street, P.O. Box 9383, Missoula, MT 59807; (406/728-9380).

Stermitz Receives Citation For Heroic Service

Two groups of floaters were saved from tragedy, thanks to the quick thinking and actions of Mike Stermitz, a game warden for the Montana Department of Fish, Wildlife, & Parks. Stermitz' quick actions and bravery were recognized by Montana Governor Stan Stephens when he was presented the Governor's Citation for Heroic Service.

On July 1, 1990, Stermitz was at the Looking Glass Fishing Access Site on the Bitterroot River checking floaters for required safety equipment when a raft hit a partially submerged cottonwood tree, causing a man and woman to be thrown into the turbulent flow. The woman clung to the cottonwood branches while the man was swept downstream into a log jam. Stermitz jumped into the river and swam to the log jam, from which he guided the man to safety. Onlookers also assisted in rescuing the victims.

Minutes later, another group of floaters on the raging river were swept onto the cottonwood snag. Four adults and a young boy were riding inner tubes roped together when their tubes and rope became entangled in the branches. Two adults made their way to shore. The others were trapped in their tubes; one man's foot was wrapped in the rope. Stermitz once again plunged into the Bitterroot River and worked his way along the tree to the victims. After nearly an hour in the water, Stermitz was able to puncture some of the unoccupied tubes to make enough slack in the rope to free the man's foot. Finally, the tubes broke loose and drifted downstream. Onlookers helped Stermitz pull the victims to safety.

Since 1989, Gov. Stephens has presented seven such awards to state employees who have displayed acts of courage and heroism while assisting others in danger.—*Liz Lodman, coordinator, Recreational Vehicle Safety Program, Conservation Education Division, Helena*

Governor Stan Stephens (second from left) presents Montana Department of Fish, Wildlife & Parks Game Warden Mike Stermitz (second from right) with the Governor's Citation for Heroic Service, as FW&P Director K.L. Cool (far left) and Warden Sergeant Randy Smith look on.

BOOK REVIEWS

PREY FOR SURVIVAL, by S. Bradley Stoner, Wilderness Adventure Books, P.O. Box 968, Fowlerville, MI 48836; 1990, 221 pages, soft cover, $10.95.

Author S. Bradley Stoner has written an adventure tale of the outdoors wherein the characters are recognizable as people we might admire or despise. The locale is described with the accuracy of a biologist and the colorful brush of an artist. The animals are as they really are—magnificently natural.

In "Prey for Survival" the outdoors is not the story vehicle, it is *the story*. As Stoner says, "The wild, beautiful and sometimes brutal wilderness of the Canadian Rockies fashions the setting...forming the fabric of the tapestry of life in a harsh environment...a life that is both real and hard, beautiful and ugly, wonderful and dangerous...a dynamic world of producer and consumer, predator and prey...and man is an integral part of it."

The two principal human protagonists are: Jedediah Marsh, an independent trapper living a life of isolation and solitude, who is called upon to wring out his last ounce of skill and courage as he finds himself among the hunted; and Jennifer Peters, bright, willful, and spoiled, who goes on a guided hunting trip with her father. Her naivete propels her into a living nightmare, first stalked by man, then beast. She finds she is stronger than she ever imagined possible.

Inexorably the web of nature draws the third major character into the drama, his presence building into a savagely provoked irruption guaranteed to raise your hackles. If you've never smelled a grizzly's dank breath, you will!

The reading public is too often lulled by crafty voyeuristic writers into seeing the wild as a pretty place, where it's always summer, where everything loves everything, and the animals are cuddly Teddy bears, and where humans and hunting have no place. If that's your idea of wild country, prepare for, in the words of Andrew Garcia—a Montana writer of an older genre—a tough trip through Paradise! "Prey" is no tale for the faint of heart, nor one to read alone in an isolated house in the mountains...you may find yourself doing a mental play on words as you *pray* for survival!—*R.E. Carroll*

THE HIKER'S GUIDE TO MONTANA'S CONTINENTAL DIVIDE TRAIL, by Tad Brooks and Sherry Jones, Falcon Press, P.O. Box 1718, Helena, MT 59624; 1990, 220 pages, soft cover, $9.95.

Sometimes it is believed that books and movies can substitute for experience, and comments such as, "That just saved me the time and effort of going there," are often heard. But more often than not, a well-written, artistic presentation is the inspirational push that rouses curious readers or viewers to plan their own outback adventures.

If you expect to fully experience hiking in Montana solely through the written word, "The Hiker's Guide to Montana's Continental Divide Trail" will not allow it. Authors Tad Brooks and Sherry Jones have written a guide that makes the Continental Divide Scenic Trail more than a mental destination. "The Hiker's Guide to Montana's Continental Divide Trail" describes a route of a lifetime and one trail your hiking boots will hanker to trek.

From Glacier National Park to Yellowstone, Montana's Continental Divide Trail traverses the backcountry of seven national forests, and the Bob Marshall, Scapegoat, and Anaconda-Pintler Wilderness areas. "The route follows existing trails through some of the best of the last remaining wilderness in the lower 48 states," the authors write.

Although not as one continuous trip, Brooks and Jones hiked Montana's Continental Divide Trail between June and October of 1989. They present the reader with the large perspective of the trip, yet pack their book with descriptive trailhead to trailhead accounts of the 961-mile hike.

"The Hiker's Guide to Montana's Continental Divide Trail" should be a primary source for anyone planning this hike. The book contains elevation charts, maps, and route descriptions for each segment of the trip, as well as a back-of-the-book list of contacts where hikers can obtain detailed maps, trail updates, or additional trail information. —*Bridget E. Moylan*

LAUGH KILLS LONESOME & Other Poems, by Mike Logan, illustrations by Mike Korn, Buglin' Bull Press, 32 South Howie, Helena, MT 59601; 1990, 74 pages, $6.95 soft cover, plus $1.50 for postage.

Like all good poets, Mike Logan takes his readers on an emotional roller coaster with his latest book, "Laugh Kills Lonesome." You'll find yourself grinning from ear to ear as you read "Reflections in a Dentist's Chair," where our "doped up t' the gills" poet dreams of what it would have been like to live in the old West:

I prob'ly would 'a partnered up
With Bridger 'n them boys
'A fightin' griz 'n Blackfeet
An' learnin' nature's joys.

In the end, though (maybe as the anesthetic begins to wear off?), he faces up to the reality of what it must have been like to have a toothache in the old days:

Oh, I might 'a fought them Blackfeet
An' treated griz some rough,
But for an old time dentist,
I ain't near tough enough.

Another of my favorites is "Gaggles 'n Gangs, McCartys 'n Hangs," a clever, well-crafted poem that regales us with some old-fashioned names for groups of animals, then invents some new ones with a distinctly western twist:

If geese all glide in "gaggles"
And elk, they graze in "gangs,"
Do you think it might be possible
That rustlers swung in *hangs?*
If you hear a "charm" of finches
Or a "parliament" of owls
Is there any way that families
Of coyotes could be *howls?*

There are sad poems, too, that describe the loneliness of the cowboy life, serious poems about timeless values, poems with a sense of history, and poems that portray the wildlife and landscapes of the West.

Mike Logan's gifted words, coupled with Mike Korn's handsome pen-and-ink drawings, make this book a joy to read.—*Dave Books*

New Technique Measures Stream Health—

SAMPLING BUGS SPEEDILY

by Bernie Kuntz

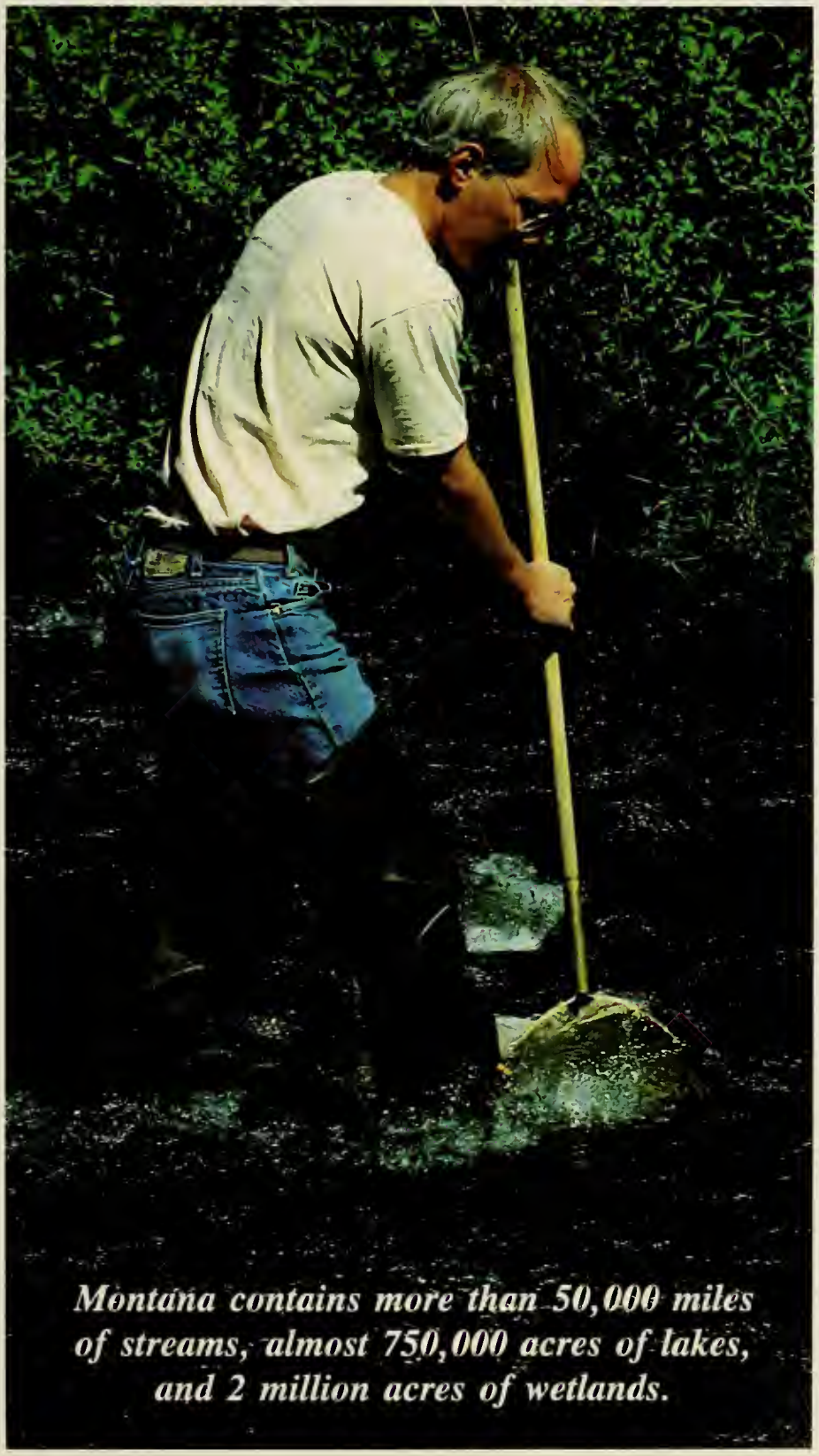
The cold waters of the spring creek feel refreshing through my leaky waders as the July sun bears down from high above the Madison Range peaks. I ease into midstream, stumbling on the slippery rocks, to photograph Bob Bukantis. He kicks at the riffle gravel causing aquatic insects—or "bugs," as he calls them with affectionate familiarity—to drift into his net.

"Be careful to stay off that section of riffle," Bob warns as he peers into the net. "I want to sample that stretch next."

So I stay put, shoot another photo, and watch the white, puffy clouds coasting across the wide sky. Bob, an environmental specialist for the Water Quality Bureau of the Montana Department of Health and Environmental Sciences, wades from the creek and records more information on the clipboard of papers he carries along with his sampling gear.

As I watch him examining samples, I think about the tens of thousands of fishermen from all over the world who will make pilgrimages to this fortunate state, and who spend millions of dollars in Montana each year. And I realize that if water quality is not what it needs to be, these aquatic insects—or macroinvertebrates, as scientists call them—will not be present in sufficient numbers, and neither will the trout that rely on them for food. And those fisherman-dollars will be spent elsewhere. Water quality is *that* important in the life of a wild trout and the organisms trout depend on for sustenance. And it goes without saying that high quality water is important to Montanans as well.

MONITORING WATER QUALITY has long been a chemical process, where a water sample was obtained



BERNIE KUNTZ

Steve Tralles, environmental specialist for the Water Quality Bureau, uses the traveling kick net method to collect macroinvertebrates.

from a creek or river, then examined in a laboratory for contaminants—heavy metals, oxygen concentration, turbidity, etc. However, water has a weakness: In the case of an illegal or accidental dumping of a chemical, a pulse of chemical can flow through a river system, killing aquatic insects and fish, and yet leaving little or no evidence at the time the sample is taken.

As early as 1909, stream studies told biologists that certain aquatic insects could not tolerate pollution. For years, the condition of aquatic insect communities has been used as an indicator of habitat conditions. However, only recently has the concept been developed into a tool for watershed management. The U.S. Environmental Protection Agency (EPA) has set up protocols (a series of steps for assessing water quality) called rapid bioassessment (because they can be done quickly). These were distributed to water quality management officials in all states at various workshops conducted in 1989 and 1990 to demonstrate a general idea of how to perform biological assessments. States are now modifying the procedure to fit local conditions. In Montana, this biological approach to water quality monitoring was first used in summer 1990 by water quality specialists in the Water Quality Bureau.

Rapid bioassessment includes water quality sampling, habitat monitoring, and sampling of aquatic organisms (macroinvertebrates, algae, and fish). The latter falls within the jurisdiction of the Montana Department of Fish, Wildlife & Parks.

Varying levels of effort, analysis, and required skills are found in the protocols, which are designed first to determine if impairment exists in a water body, then the degree of impairment, and finally a ranking based on the level of observed impairment. Streams are then ranked for future monitoring or cleanup.

Macroinvertebrates are aquatic animals with external skeletons large enough to be seen with the naked eye. Algae are simple aquatic plants that lack roots, stems, and leaves. Both respond to a wide variety of pollutants and other disruptions in aquatic ecosystems including organic enrichment, pesticides, salts, sedimentation, heavy metals, thermal changes, acidification, petroleum spills, industrial effluents, and flow fluctuations. Macroinvertebrates and algae have distinct habitat preferences and they are relatively immobile; hence, they are unable to escape pollutants or other changes in their environment.

BERNIE KUNTZ

Environmental specialist Bob Bukantis (above) examines macroinvertebrates captured from a Montana stream. Aquatic life is a reliable indicator of water quality.

Since degradation of water bodies in Montana is often a slow, insidious process, water quality managers determined they needed a Reference Stream System to compare the condition of impaired streams to reference streams—those that are relatively pristine. Reference streams in the state's seven ecoregions (the ecoregions were arrived at by determining climatic, geologic, floristic, and topographic similarities) are being monitored using the rapid bioassessment approach as part of Montana's Nonpoint Source Pollution Control Program. The reference stream is used as a standard to judge level of impairment.

As recovery of these impaired streams proceeds, the state can use the reference streams to evaluate progress in achieving an attainable cleanup goal.

Using macroinvertebrates and algae to characterize water quality is not new in Montana, according to Dr. Loren Bahls, supervisor of the Water Quality Management Section in Helena.

BERNIE KUNTZ

DAVE BOOKS

"The Water Quality Bureau has been doing this since the 1950s," Bahls said, "but this is the first time the procedures have been formalized and applied statewide to minimally impaired waters."

Beginning this year, Montana, along with other states, will incorporate biological criteria into its Surface Water Quality Standards following guidance from the EPA and using the reference stream data collected in 1990. The standards are a formal state rule that (1) classifies state waters on the basis of beneficial uses, and (2) defines the limits (criteria) to which those waters can be changed while still protecting the beneficial uses. The limits or criteria can be physical (temperature), chemical (concentration of a heavy metal), or biological (number of species of bugs or algae that should be present).

"GIANT STONEFLY," Bob observes as he holds the sinister looking macroinvertebrate in the palm of his hand. "The Madison drainage is world-renowned for its stoneflies."

"Yeah, I know. I fished the Madison many times using stonefly imitations. Locals also call them salmonflies, and around here the hatch comes off most years about the third week of June."

Bob picks through his booty, describes each macroinvertebrate by scientific name, and he tells me to which genus each belongs...this, from the fellow who likes to call rapid bioassessment "bug-sampling."

Bob, who holds a bachelor's degree in botany, a master's degree in aquatic ecology, and has completed most requirements toward a Ph.D. in zoology, continues to explain the advantages of bioassessment: "If someone dumped bleach or some other contaminant into a stream, it would be futile to take chemical measurements because the pollutant would have already washed away. Instead, we check aquatic insects in the stream. If there are none or only a

The giant salmonfly nymph (above left) is found in large numbers in many unpolluted Montana streams. Montana's fabled trout waters, like the Madison River (left), attract fishermen from all over the world. If water quality declines, so do aquatic insects and the trout that depend on them for food.

BERNIE KUNTZ

This sediment entering a creek near Helena was caused by a bridge-building crew. Such sediment suffocates trout eggs, fills in gravel riffles, and otherwise degrades stream habitat for macroinvertebrates and fish.

In Montana, about 90% of the water quality problems are attributable to pollutants from nonpoint sources—sediment, salts, fertilizers, herbicides, heavy metals, and other pollutants washed into streams and rivers from the land. Point sources (municipal and industrial discharges), on the other hand, account for less than 10% of the state's impaired, or adversely affected, surface waters.

few, we know there was a problem, and we explore further.

"But if we are just measuring for the presence of chemicals, we might be looking into a blind alley," Bob says. "The dumping could have caused extensive damage, but now the chemical is gone without a trace. When you take a 'bug' sample, you are measuring the health of that aquatic community for what has been going on for a much longer time—maybe for months or years before your visit. Chemical analysis of the water, on the other hand, may tell you nothing about what happened yesterday or the day before.

"You could measure chemical parameters in a stream to get an idea of its health," Bob says. "However, factors like sewage, nutrients from agriculture, salts from irrigation, sediment from a variety of causes, and elevated temperatures all contribute to pollution of a stream...."

Aquatic insects integrate all factors of water quality, and consequently provide an overall reading of the health of the aquatic community. This biological monitoring provides a direct measure of the level of impairment of one beneficial use of water—its ability to support aquatic life. It may also indicate the ability of the water to support other beneficial uses such as drinking, recreation, irrigation, or industry. Aquatic life is often the most fragile and sensitive use.

A week later at a rapid bioassessment workshop in Bozeman, I met Dr. Fred Mangum of the U.S. Forest Service's Aquatic Laboratory at Brigham Young University. Dr. Mangum has been working with biological assessments since 1972. "Water chemistry didn't answer as many questions as it should have," he said. "Everything that happens in an entire drainage shows up in a stream, and biological monitoring reveals what is happening and what has happened."

Rapid bioassessment is cost effective because it is relatively fast. Michael Barbour, manager of field biomonitoring for EA Engineering, Science, and Technology of Sparks, Maryland, says that one biologist can monitor 300 to 400 stream sites per year. "If anything, we may want to one day change its name from rapid to *community* bioassessment," Barbour said. "The aquatic system gives us good indicators of localized conditions, we can see effects of short-term environmental variations, and the sampling is relatively easy."

Rapid bioassessment in Montana's reference streams might be called a way to monitor streams to keep the good ones the way they are and to recognize the problems of impaired or polluted ones. One day, perhaps Montana's water bodies can be rehabilitated to the condition they were in when Lewis and Clark ascended the Missouri, when far more rivers and creeks than now ran bright and clean.■

Dinosaurs of the Deep

by Pat Clancey

MARK CALAMAR

The Missouri and Yellowstone rivers of eastern Montana may be the last stronghold of the endangered pallid sturgeon—a species that has existed for 200 million years.

Pangaea, the great land mass which separated into present-day continents, had drifted together 50 million years earlier, and would still be whole for 20 million years. Dinosaurs had inhabited the land for 25 million years, but had not yet begun to dominate the planet. The first birds and mammals were still millions of years away. It was over 200 million years ago that the pallid sturgeon evolved in large, turbid prairie rivers.

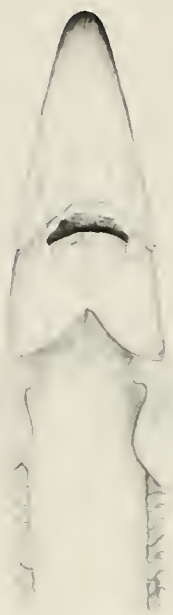
The pallid was well equipped to live in its world. Water flowing up over its long snout and head and along its humped back made it easy for the fish to stay close to the river bottom, even in the strongest currents. The four barbels, whiskerlike sensory organs on the underside of the snout in front of the mouth, were much more useful than eyes for locating food. The soft, protruding mouth acted like a vacuum cleaner sucking up insects, crustaceans, worms, and fish sensed by the barbels. Unlike fish that evolved later, the pallid did not have scales; most of the body was covered with skin the texture of sandpaper. Five rows of sharp, bony plates (scutes) ran the entire length of the body.

The world has changed a great deal in the last 200 years, let alone the last 200 million. But the pallid sturgeon has changed little. The thought of stepping outside and seeing a *Tyrannosaurus rex* or a *maiasaurus* today occurs only in a child's imagination. But pallid sturgeon still swim in Montana's Missouri and Yellowstone rivers. Yet few people share the wonder of this fact.

RELATIVELY FEW SPECIES OF PRIMITIVE FISH REMAIN TODAY, but eastern Montana waters are home to three—the paddlefish, shovelnose sturgeon, and pallid sturgeon. All three have skeletons composed mainly of cartilage, not bone, and all survived the Ice Ages, the last a mere 10,000 years ago. Today the pallid sturgeon faces what may be its greatest threat. The changes that are believed to have brought the pallid to the brink of extinction after 200

Pallid Sturgeon

- inner barbels much shorter than outer barbels
- barbels attach about one-third of the way between mouth and tip of snout



Anglers must look closely to distinguish between pallid and shovelnose sturgeon. The law requires that all pallid sturgeon be released.

Shovelnose Sturgeon

- inner barbels about the same length as outer barbels
- barbels attach about halfway between mouth and tip of snout

million years of existence have occurred in just the past 50 years—the equivalent of less than .00001% of the time the species has existed.

Once abundant enough to be captured in commercial fish nets, pallids are uncommon today. Commercial fishing operations in the Missouri River in North and South Dakota during the late 1800s severely reduced sturgeon populations. The pallid may have been heavily harvested at that time, but harvest records do not distinguish species (the pallid was not described as a separate species until 1905) or list sizes of individual sturgeon. Pallids were also relatively common and were commercially harvested in the Dakotas during the 1950s and '60s when the Missouri River reservoirs were first constructed.

Anglers who fished the Missouri and Yellowstone years ago tell of catching several pallids per day. Photographs taken in the 1950s and '60s show daily catches of up to six or seven pallids, but today they are rarely hooked. The U.S. Fish and Wildlife Service (USFWS) compiled a list of all known pallid sightings for the past three decades. They found 500 sightings in the 1960s, 209 in the '70s, and only 56 in the '80s. The USFWS classified these prehistoric bottom-dwelling fish as endangered under the Endangered Species Act on October 9, 1990.

THE HISTORIC RANGE OF THE PALLID

extends from the Missouri River near Fort Benton to the mouth of the Mississippi River; and includes some of the larger, more turbid tributaries of the system. Records suggest they were most abundant in the Missouri River in the Dakotas. Today, Montana may be their last stronghold, due mostly to the relatively unaltered stretches of the Missouri and Yellowstone rivers. The channelization and damming of the Missouri through the Dakotas and Nebraska for flood control, hydropower, and barge traffic has drastically reduced the pallid's habitat. In the proposal that appeared in the *Federal Register* to list the pallid as endangered, it was noted that 51% of the pallid sturgeon's range has been channelized, 28% impounded, and 21% affected by upstream impoundments, with resulting alterations in flow and temperature regimes. Factors such as these affect the fish by blocking access to, or outright destruction of, spawning, rearing, and food-producing areas; they also alter flow and temperature conditions necessary for successful spawning and incubation of the eggs and rearing of the young.

These developments—which have changed the Missouri River from an uninterrupted, free-flowing turbid river with a large spring flood into a series of lakes separated by stretches of clear, cold, regulated rivers—pose serious problems for the pallid sturgeon, as well as other species that evolved with the "old" river. The least tern has been classified as endangered and the piping plover as threatened; both nest on the banks of the river. A petition has been filed to list the paddlefish as well; the USFWS will make its decision on the petition in 1991. Other fish species are candidates for listing, but no action has yet been initiated.

Additional threats to the pallid include hybridization with shovelnose sturgeon, overharvest by uninformed anglers, inability to successfully spawn due to their low numbers, and pollution of the waters in which they live.

An angler has to look closely to distinguish between a pallid and a shovelnose. Until recently, Montana regulations only required the release of any sturgeon over 16 pounds. The Montana Fish and Game Commission has amended the regulation to require release of all pallid sturgeon, regardless

GLEN MEIER

The sturgeon shown above were photographed in the tailwaters of Fort Peck Dam. The larger fish is a pallid, the smaller a shovelnose.

of size, but still includes the 16-pound rule for the shovelnose. North and South Dakota changed their regulation to require release of *all* sturgeon.

Smaller pallids may be distinguished from shovelnose by easy-to-spot differences in the barbels (see diagrams). On a pallid sturgeon, the inner two barbels are much shorter than the outer two; on a shovelnose, all four barbels are nearly the same length. On the pallid, the barbels are closer to the mouth than to the tip of the snout; on the shovelnose, they are about halfway between the mouth and snout. Other differences are described in the department's 1990-92 fishing regulations.

The sparsity of pallid sturgeon throughout their range, coupled with their infrequent readiness to spawn, could preclude a male and female from finding each other when both are ripe. This could result in either no reproduction by pallids (which may already be the case) or hybridization of pallids with shovelnose, which would further imperil the species.

The feeding habits and the longevity of the pallid leave it vulnerable to toxins and pollutants. Pallids actively feed on bottom-dwelling insects, crustaceans, worms, and other fish, so they are vulnerable to toxins which settle in the river bottom and accumulate in food items. They are also susceptible to the toxins present in the water used during respiration. Because they are long-lived, they are exposed to these toxins for decades and the gradual accumulation could affect the pallid sturgeon and its ability to reproduce.

Preliminary tests conducted on shovelnose sturgeon, captured in August 1988 near the confluence of the Missouri and Yellowstone rivers, showed elevated levels of lead. The source of the lead is unknown. Further tests are scheduled to confirm these results and to determine the extent of the contamination, or if this was an isolated case involving a few fish.

THE ENDANGERED SPECIES ACT MANDATES DEVELOPMENT of a recovery plan for any species listed under it. The recovery plan is intended to ensure survival of the target species. It identifies the causes for the species' decline and specifies actions needed to reverse the decline. The USFWS is responsible for preparing the recovery plan for the pallid sturgeon, and has assembled a recovery team composed of pallid sturgeon researchers to develop the plan. Montana's representative periodically meets with other sturgeon researchers from the state so they can develop the best possible program for Montana's pallid sturgeon.

A critical aspect of the recovery plan is determining which factors limit numbers. This requires in-depth knowledge of pallid sturgeon biology. Despite the fact that pallids have been around for over 200 million years and concern for their welfare is widespread among fish and wildlife agencies throughout the Missouri River Basin, biologists simply do not understand enough about their habitat requirements or life cycle. Once their biology is better understood, it will be possible to identify those limiting factors and recommend actions to reverse the pallid's decline.

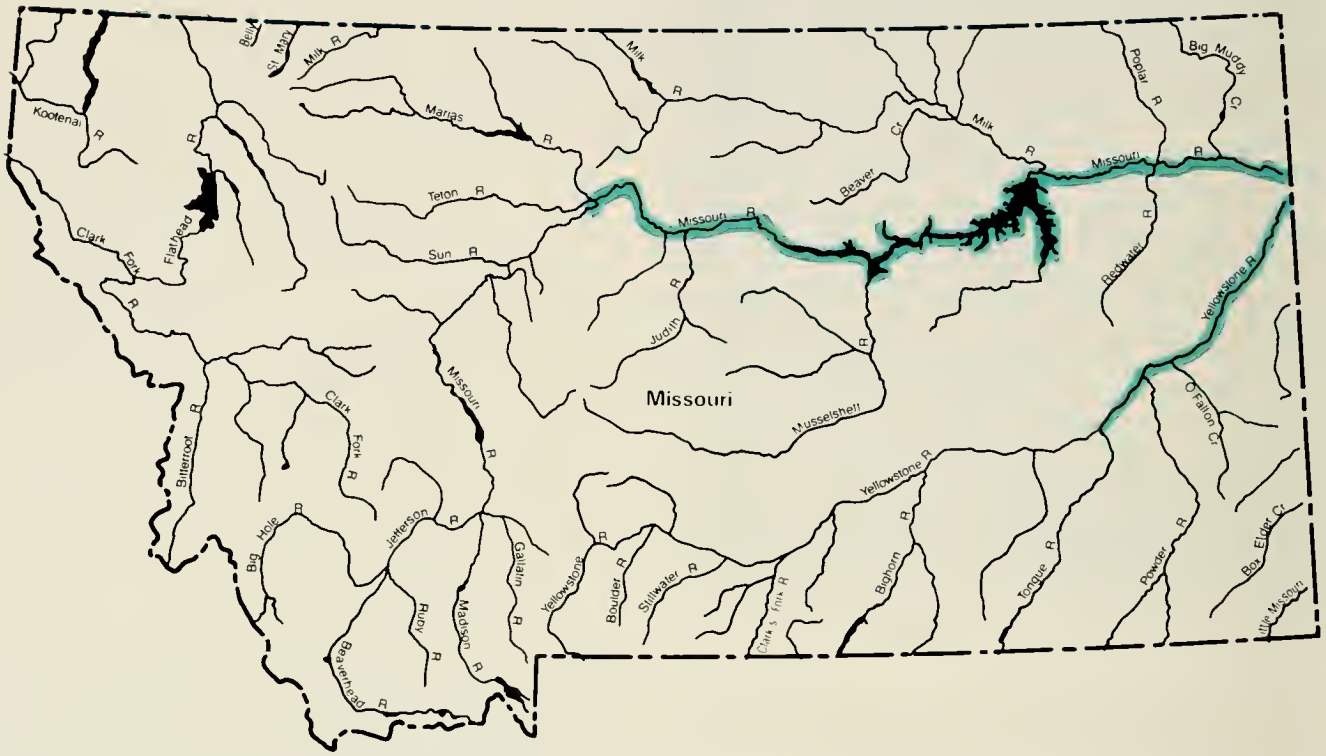
It is likely that a program to propagate the pallid sturgeon through hatchery production will be an important part of the recovery plan. Researchers have outlined a program which will be implemented cooperatively by various state and federal agencies, provided certain conditions are met. Those conditions include proper training of the personnel who perform the surgical removal of eggs from the female and determining if the surgery should be performed at the capture site or if the fish should be transported to a hatchery. Two years of preliminary work with shovelnose sturgeon has provided encouraging results.

RECREATIONAL SCUBA DIVERS KNEW that shovelnose sturgeon concentrated in the tailwaters of Fort Peck Dam during the winter and were often so abundant that the river bottom was literally blanketed with them. In February 1988, three divers reported to Montana Department of Fish, Wildlife, & Parks biologists at Fort Peck that they had seen three extremely large sturgeon while SCUBA diving the previous weekend. Biologists knew these had to be pallids—and seeing three at one location demanded further investigation. Biologists accompanied the divers on subsequent dives and confirmed the pallids' presence. This finding provided new impetus for pallid sturgeon research efforts.

In March 1989, FW&P biologists began researching the pallid sturgeon population in the Missouri River above and below Fort Peck Dam and in the Yellowstone River (see distribution map). The work under way on the Missouri downstream from Fort Peck and on the Yellowstone is funded mostly by the U.S. Army Corps of Engineers, which owns and operates the dam. Objectives include determining the status, abundance, and life-cycle requirements of the pallid sturgeon population in Montana.

In cooperation with the Prairie Divers SCUBA Club of Glasgow, three pallid sturgeon were captured in the tailwaters of Fort Peck Dam in March 1989, and two more were captured

DISTRIBUTION OF THE PALLID STURGEON IN MONTANA



in the winter of 1990. Biologists measured each fish and wired radio transmitters to the dorsal scutes (the series of sharp, bony plates that lie along the back). Biologists have taken the same series of measurements from shovelnose sturgeon throughout the Missouri and Yellowstone rivers to document structural differences between pallid and shovelnose and to see if any hybrids exist in Montana.

Unfortunately, all three pallids tagged in 1989 dropped their transmitters in June of that year. Before losing the transmitters, two were tracked as they moved downstream. One traveled over 100 river miles, and the other almost 60. The third pallid could not be located with the radio telemetry gear, and probably never left the Fort Peck area. This pallid was recaptured in a gill net in the Fort Peck tailwaters in August 1989. Biologists attached a replacement transmitter, using a modification of the original technique. This same modification was used on transmitters attached to two pallids captured in winter 1990, and to four more pallids captured near the mouth of the Yellowstone River in September 1990.

Because of the chemical make-up of water in the Missouri River, the signal cannot be detected from deeper than about 15 feet. The area in the Fort Peck tailwaters that sturgeon prefer is 30 to 40 feet deep. The transmitters attached to the pallids in the winter of 1990 have a sonic component as well as a telemetry component. The sonic component requires use of an underwater hydrophone to receive the signal, so it cannot be used from an airplane. But the advantage is that it allows for reception of the signal in water deeper than 15 feet. Areas this deep and deeper exist near the mouth of the Yellowstone River as well as around Fort Peck. SCUBA surveys in the river are fruitless after the ice is off the reservoir because of poor water clarity.

In addition, each captured pallid is injected near the dorsal fin with a Passive Integrated Transponder (PIT) tag. When a hand-held detector is passed over the area of the PIT tag, the tag is electronically stimulated to emit a signal which is then received and displayed by the detector. With this system, each fish is individually identifiable throughout the remainder of its life. This is useful since the radio transmitters have a life span of only one year.

As the pallids move out of the Fort Peck tailwaters, they are tracked by airplane to identify migration patterns and important habitat. Once biologists determine a location from the air, a crew returns to the area by boat and relocates the fish in the water. They measure several habitat variables which enable them to add to knowledge about the specific type of habitat preferred by pallids. During the late spring and summer, biologists attempt to recapture the pallids to see if they are in spawning condition.

Using nets and setlines, FW&P crews have captured five pallid sturgeon in the Missouri River upstream from Fort Peck Reservoir and have attached radio transmitters to them. Biologists are tracking these fish in a fashion similar to those below Fort Peck.

Until we understand the requirements of the pallid sturgeon to successfully complete its life cycle, and make strides to meet those needs, the pallid will remain imperiled. Anglers can help by complying with the commission's recently adopted regulations and by reporting the presence of any pallids seen to a department biologist. ■

READERS RESPOND

Mom—Thanks for the Magazines

I wanted to relay a message to my mother Yvonne, fellow Montanans, *Montana Outdoors* readers, and its staff. I've been stationed at Fort Campbell, Kentucky, since August 1988. Since I left Montana, I've received your magazine and enjoyed every issue that Mom sent.

Recently, I was deployed to Saudi Arabia, and she never let me down. In every package I received, there were a couple of *Montana Outdoors* magazines.

After five months of nothing but sand, large insects, small shrubs, and helicopters, your magazine has become a gateway for me to the world's most beautiful places—from a majestic mountain peak full of wildlife to the open plains that hold seeds a farmer sowed the fall before.

Montana truly is "The Last Best Place." Thank you *Montana Outdoors* staff—and thanks, Mom, for their magazine.—*Brian Bunk, Operation Desert Storm*

• *We're pleased if* Montana Outdoors *can bring Montana a little closer to you and the other courageous men and women serving in Operation Desert Storm. All Montanans share in wishing you a safe and speedy return.*

In cooperation with the Montana National Guard, we have shipped 600 back copies of the magazine to Montana reservists and National Guard members serving in the Persian Gulf.—Ed.

Remembering Bob Watts

Although I knew that Bob Watts had passed away this summer, it was still with a great deal of sadness that I read Gary Olson's remembrances of him in the Nov./Dec. 1990 issue of *Montana Outdoors*. Reading the article brought back a flood of memories of my friendship with Bob and his lovely wife Nancy.

In 1971 I was hired by Dick Johnson to work the Lewistown area as a fish biologist for what was then the Montana Department of Fish and Game. The biologist I was replacing had already left and since I was coming from Washington, I did not know the area or the agency. Bob was kind enough to fill both those needs. During the time I was in Lewistown, he would often assist me with my field work when I needed it and I enjoyed returning the favor.

In addition to this professional relationship, Bob and I became personal friends. He graciously shared his knowledge of local bird hunting lore and locations. We shared many a day hunting ducks, sage grouse, pheasants, and sharptails with our black Labs. These are moments of my life that I'll treasure always. After I left Lewistown, I returned as often as I could during the fall to rekindle that friendship and add to those memories.

Like Gary Olson, I also came to know and respect Bob's professional side. His width and depth of knowledge and his willingness to share it was equal to that of anyone I have known. His personal and professional dedication and ethics were beyond reproach.

I believe in the immortality of the soul. Therefore, though I mourn Bob's passing, I look forward to renewing my friendship with him. I think he's a few birds up on me and I intend to get even.—*Duane E. Phinney, chief, Habitat Management Division, Washington Department of Fisheries*

The Beauty of Montana in a Grand Light

Again *Montana Outdoors* has come up with an issue that, through photographs, captioned by choice bits from Charlie Russell, sets the beauty of Montana in a grand light.

Examples of Charlie's citations are: "In spite of gasoline, the biggest part of the Rocky Mountains belong to God." Also, "Nature has been my teacher; I'll leave it to you whether she has been a good one or not."

Charlie's sensitive expressions throughout the publication coincide with my sentiments. I grew up on a farm in the Pennsylvania mountains and later visited Montana on many occasions. These inspiring experiences cause me to cherish the beautiful photographs in *Montana Outdoors.—Marlin H. Bruner; Clemson, South Carolina*

* * * * *

Please send me additional copies of the Special Photo Issue. With these photographs, toned to the language of Charles M. Russell, you have painted yourselves into a corner—there is no hope that future issues can equal or exceed 1991.

Congratulations on such a fine issue.—*James M. Glenn; Steedman, Missouri*

* * * * *

I have always enjoyed *Montana Outdoors* magazine, but I feel the current Special Photo Issue is SUPER. The pictures are outstanding and the comments by Charlie Russell add a great deal.

The picture of the two mountain goats by Nelson Kenter has a wonderful feel to it. I don't think I have ever seen a more striking outdoor panorama than the picture of alpine larch and huckleberry bushes in the fall.

I could rave on, but hope the examples give some idea of how much I am enjoying the magazine.—*Bob Cooney, Helena*

Gumbo Muddies Map

Kay Morton Ellerhoff may have lost her map in that Garfield County gumbo because that is not the location of the dig she wrote about ("*T. rex* Rises Again," Nov./Dec. 1990). The skeleton was found in McCone County of which Circle is the county seat.—*Vic Reinemer; Washington, D.C.*

• *You're right. We checked with Shelley Abbey, director of marketing for the Museum of the Rockies, and she confirmed your map-reading proficiency: It's close, but the skeleton was found in McCone County. The county question was also raised by State Representative Betty Lou Kasten (R-Brockway).*—Ed.

Only One Way to Fail

As usual, we read your magazine from cover to cover. We have enjoyed Montana's greatness and hospitality both through vacations and hunting trips for many years.

The article, "Up the Creek and Over the Mountain," in your Nov./Dec. issue deals with attitudes (ethics) that I wish *all* hunters and sportsmen would portray. As with Bernie Kuntz, the only "failure" I have as a hunter is the season in which I don't participate.—*Elaine Hagen; Bovey, Minnesota*

Doorways to Adventure

by Bruce Rehwinkel

Montanans enjoy a fishing resource with no real rivals. From world-renowned trout fisheries to the growing interest in warm-water reservoir fisheries, Montana is the place of which anglers dream. Providing public access is essential to the angler—and the angler has long supported access programs. Today, Montana's Fishing Access Site System is one of the largest and most diverse anywhere.

The Department of Fish, Wildlife & Parks manages 300 fishing access sites. Most are small and relatively undeveloped. Control of these sites is the result of fee title acquisition, lease, or easement. Some sites are organized in a series, offering float fishing access points through an entire river system; others provide access to mountain lakes or prairie ponds. Still others are single sites on streams. Angling opportunity is as varied as the species Montana offers—trout, salmon, walleye, sturgeon, bass, and catfish, to name a few.

This system did not happen by accident. The concept of providing public fishing access began nearly 50 years ago when department acquisitions were almost exclusively limited to game ranges. Some game ranges included accesses to waters which were used by fishermen. Angling became more and more popular with the public; in 1964, department reorganization resulted in a charge to a newly formed Recreation and Lands Division to develop fishing access opportunities. The final building block was set in place in 1977 when anglers were successful in creating a fishing access program supported by earmarked license fees. Today, the earmarked fees include $5 from the non-resident season license and $1 from each resident season and non-resident two-day license.

A major portion of the program has been aimed at providing float fishing access opportunities along Montana's more popular rivers. A general guideline used in locating these sites is to provide a four-hour float between sites. Newly emerging areas of focus are smaller rivers, medium to small lakes and reservoirs, bank angling along smaller streams, and spring creeks and cooperative efforts on private ponds, especially sites offering warm-water angling opportunities.

While the Fishing Access Site System is popular and heavily used, it suffers from an identity crisis. The identity of this distinct system is hidden from the casual observer by numerous other public recreation sites. The U.S. Forest Service, Bureau of Land Management, local governments, and the state of Montana all provide public access. FW&P has sites classified as state recreation areas, state monuments, state parks, wildlife management areas, and fishing access sites.

Each of these FW&P-operated sites has different management objectives, with widely different levels of development. Questions about who manages a site, why it exists, and what a recreational user can expect has created some confusion. In an attempt to reduce the confusion, FW&P will reclassify its sites in 1991. All sites will be classified as either state parks, wildlife management areas, or fishing access sites.

The mission of the department's parks program is to conserve the resources of the state and provide for their use and enjoyment, thereby contributing to the cultural, recreational, and economic life of the people and their health. This definition leaves little doubt that the park system has diverse recreational responsibilities.

Conversely, the Fishing Access Site System exists to provide recreational access to the state's streams, rivers, and lakes.

A GENERAL DIFFERENCE BETWEEN A PARK SITE AND A FISHING ACCESS SITE is level of development. Parks are managed for diverse recreational resources (i.e., scenic, historic, archaeologic, scientific, scenic, and recreational) *on site.* This includes camping, hiking, and educational activities. The intent of fishing access is directed toward angling opportunities on waters which extend *beyond the bounds of the department's property ownership.* The body of water and the resources it contains—which are simply accessed by the site—are the entire focus of the Fishing Access Site System.

Understanding issues surrounding fishing access sites has been aided in recent years by two independent surveys. A 1988 survey of a limited number of sites found that anglers comprised an average of only 34% of the site users. The non-fishing user group was attracted to the site by the access it provided to water. The majority of the use of these sites is by Montana residents (75%). Another survey conducted in 1990 identified the level of site development as an issue, but one with regional implications. The survey indicated that users from west of the Continental Divide expected a higher level of site development than other Montana users.

The Fishing Access Site System's approach has been to make minimal improvements, thus maintaining a natural experience and reducing costs. Minimal improvements include gravel roads, parking, boundary fences, and boat ramps (where appropriate). As use levels increase, latrines and possibly trash collection services are added. In addition, new efforts are under way to provide more access opportunities for handicapped users. Upgrading sites and adding handicapped modifications to the Fishing Access Site System will cost nearly $4 million.

THE MAJOR CHALLENGE FACED faced by the Fishing Access Site System is how to balance the slowly expanding system with ever increasing costs of site development and maintenance.

Regional Parks Division employees maintain fishing access sites; their work is funded by license dollars. Even with minimal maintenance, Parks Division efforts cost about $600,000 each year. This cost far exceeds the annual revenue generated by the earmarked license funds—less than $400,000 a year. Of this total, by law 75% must be reserved for site acquisition or lease, while the remaining 25% may be used for development and maintenance. The balance comes from the department's general license account and federal aid.

The solution to providing improved yet low-cost maintenance is not clear, and department officials are exploring many possibilities. At some sites, organizations and local governments have assisted by taking over maintenance chores. Other sites have been "adopted" by interested groups. Contracting private caretakers may help reduce operating costs. Cooperative management with the Bureau of Land Management and the U.S. Forest Service at some sites is another possibility. Finally, department officials are looking at the feasibility and desirability of charging users who have not purchased hunting or fishing licenses.

In an effort to upgrade the Fishing Access Site System, Federal Aid in Sport Fish Restoration funds are being employed to support 75% of the development work. These federal funds come from excise taxes on fishing supplies, boats, and boat fuels. If Montana is able to maintain the rate of development initiated during these last two years, the system will have up-to-date developments in approximately six to eight years.

SPORT FISH RESTORATION

Your purchase
of fishing equipment
and motor boat fuels supports
Sport Fish Restoration and
boating access facilities

Montana is especially fortunate to have an extensive Fishing Access Site System. This system attests to the long-term dedication and commitment of Montana anglers. Department efforts have resulted in changes in how fishing access sites are developed. These changes will ensure the system's successful continuation. Immediate work includes expanding development at certain sites, making modifications to provide better access for handicapped users, and improving the efficiency of maintenance efforts. With the continued support, patience, and cooperation of the angling public, Montana is to sure have a Fishing Access Site System that is the envy of the nation. ■

DAVE BOOKS

The Department of Fish, Wildlife & Parks manages 300 fishing access sites across Montana. The program has a well-defined focus: providing recreational access to the state's streams, rivers, and lakes.

CONTRIBUTORS

• Efforts to establish and manage wild turkeys during the past 36 years have provided new and expanding turkey populations in many areas of Montana. As **Brian Giddings** writes, "The tremendous success....has created a growing enthusiasm for both spring and fall turkey hunting opportunities and a heightened awareness of turkey populations across the state." Giddings also writes about the wild turkey's management, hunting and harvest, April gobblers, calling turkeys, and sex and age identification. Sidebars accompanying his article tell you when, where, and how to hunt, and some details about the work of the National Wild Turkey Federation. For a look at "Merriam's on the Move," turn to page 2. Giddings is a department fish and wildlife biologist, headquartered in Forsyth.

* * * * *

• It's a mouthful: rapid bioassessment. But as **Bernie Kuntz'** article shows, it's merely a matter of "Sampling Bugs Speedily." The bugs are aquatic insects and they are indicators of a stream's health. If someone dumped some contaminant into a stream, it would be futile to take chemical measurements because the pollutant would already have washed away. Instead, biologists check the health of the aquatic community because the "bugs" reveal what has been going on for a much longer time. Kuntz was recently hired as the department's information officer in Bozeman; when he wrote the story beginning on page 15, he was working as education coordinator for the Department of Health and Environmental Sciences.

* * * * *

• They truly are "Dinosaurs of the Deep." They've been around for over 200 million years, and the real marvel is that they still swim in Montana's Yellowstone and Missouri rivers. The pallid sturgeon, however, is far from thriving. On October 9, 1990, it was listed as endangered on the U.S. Fish and Wildlife Service's Endangered Species List. Biologists are trying some new techniques to better understand the biology of these prehistoric bottom-dwelling fish. For some fascinating insights into pallid sturgeon, turn to **Pat Clancey's** article on page 19. Clancey is a fish and wildlife biologist for the department in Fort Peck.

* * * * *

• Montana's 300 fishing access sites are "Doorways to Adventure." They offer access to streams, rivers, and lakes—for fishing, floating, swimming, and boating. **Bruce Rehwinkel** tells you about Montana's Fishing Access Site System, one of the largest and most diverse found anywhere. He explains how fishing access sites are funded, and how it's easy to become confused over who manages which sites. Rehwinkel is assistant bureau chief in the Fisheries Division's Management Bureau. His article begins on page 24.

* * * * *

• Their color dazzles. Their success story astounds. And to some people, the mere sight of one is proof that it's *really* spring. "Bluebirds in the Big Sky" will tell you some bluebird facts of which you might have been unaware: Montana is one of the few states that hosts all three species (mountain, western, and eastern); and the reported number of bluebirds fledging from next boxes in Montana has risen from five in 1974 to 10,300 in 1988. **Bridget E. Moylan** also writes about Montana's Centennial Bluebird Trail. A sidebar lists some DOs and DON'Ts for those interested in building bluebird boxes. Moylan is a graduate student in English at the University of Montana. She served as an intern in the department's Conservation Education Division in fall of 1990. She received her undergraduate degree from Carroll College where she was editor of the student newspaper, The Prospector. Turn to her bluebird story on page 27.

* * * * *

• *Montana Outdoors'* "Perspectives" series continues with **Channing W. Welin's** vignette about a week-long chinook in February that propelled him into a mid-Yellowstone River trip, accompanied by "a duck-dog companion, a minimum of camping gear, and plain food." Along the way, he fails at prospecting for rainbows with deeply sunk streamers, he succeeds at enjoying the sun the trout shun, and he is treated to a parade of birds flying close as their feeding time ends. Welin describes himself as a "gardener, peripatetic ranch hand, and anglers' guide, all near Big Timber." Turn to his "Montana Mardi Gras" on page 32.

* * * * *

• In the good ol' days, federal agencies like the U.S. Fish and Wildlife Service (USFWS) and the Department of Fish, Wildlife & Parks (FW&P) were either unable or unwilling to consider wildlife projects on private land. Habitat improvement projects were confined to public land and private land was off-limits. As **Jim Stutzman** writes, "Fortunately, things have changed. Wildlife professionals now realize that resource conservation cannot be limited to public land alone. They also realize that tremendous opportunities exist for enhancing wildlife habitat *and* promoting stewardship on private land." For a look at the USFWS' Private Lands Program, turn to "Restoring Wetlands on Private Lands" on page 34. As he summarizes, "The idea is to improve private land for ducks." Stutzman is the Montana farmland/wildlife coordinator for the USFWS; his headquarters is Bowdoin National Wildlife Refuge near Malta.

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• *MO* thanks the following photographers for their contributions to this issue: **Dave Bennett** and **Lee Kaiser**, Kalispell; **Mark Calamar**, Fort Peck; **Phil Farnes**, Bozeman; **Michael H. Francis**, Billings; **Mike Logan** and **Ed Tyanich**, Helena; **Raleigh Meade**, Great Falls; **Glen Meier**, Glasgow; **Bridget E. Moylan**, Missoula; **Jim Stutzman**, Malta; **Tom J. Ulrich**, West Glacier; **Channing W. Welin**, Big Timber; **Steve Wirt**, Whitefish; and **Brian Giddings**, **Greg Risdahl** and **Tom Warren**, who work for the department.■

The dazzling blue spring sky drops a piece of color on wing. In flight, a bird spurts forward, glides, then lifts, slows, and sets against foliage and wood. His shoulders round to a hunch, and a shivering shake ripples his feathers. Yes, the bluebird is back with us,

Bluebirds in the Big Sky

by Bridget E. Moylan

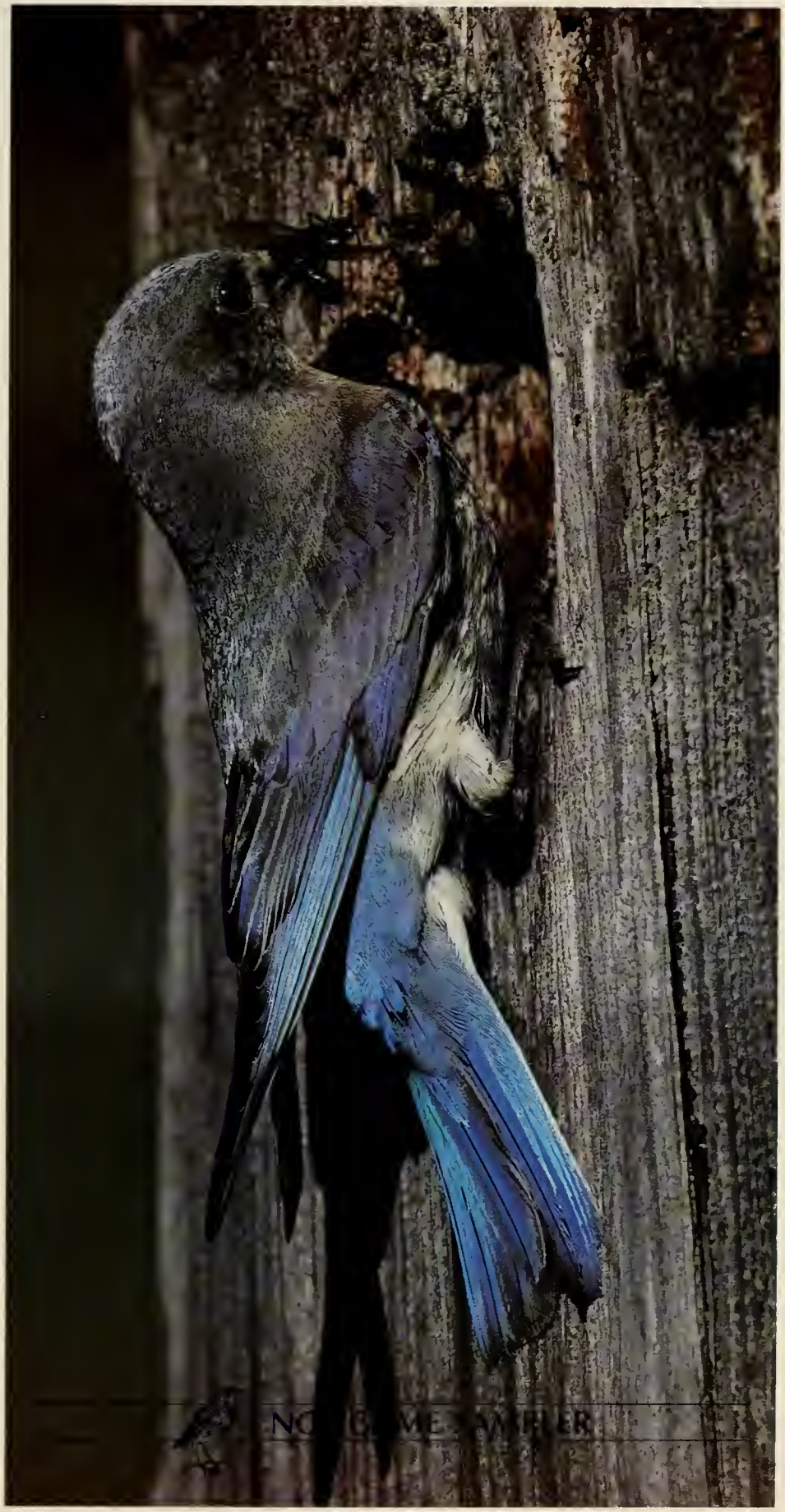
sailing strong in the Big Sky and warbling happiness to spring-lifted spirits.

If you've seen a bluebird this month, count your blessings: Spring has arrived.

Montana is one of the few states that hosts all three species of bluebirds: the mountain *(Sialia currucoides)*, western *(Sialia mexicana)*, and eastern *(Sialia sialis)*. In all three species, the male sports a blue overcoat and hood, but distinguishing one from another is easy. The eastern bluebird has a rust throat, while the western has a collar of blue and rust on his upper back and shoulders. The eastern and western bluebirds both have rust breasts and white bellies. Both are also five to six inches long and have a hunched or round-shouldered stance. On the other hand, the mountain bluebird stands more upright and is six or seven inches long. He carries no rust coloring but has traces of white on his chest and belly.

The mountain bluebird ranges the entire state while the western and eastern bluebirds stick to their respective borders.

Although the three species of blue-



LEE KAISER

Thanks to a bluebird nest box program and hundreds of concerned citizens, Montana's bluebird populations have made an amazing comeback.

birds differ slightly from one another in range and coloration, they all belong to the thrush family (which also includes robins), are cavity nesting birds, and survive on a diet of insects and berries.

As it scouts for food from its perch, a bluebird's vision extends 100 yards. The mountain bluebird hovers and drops for insects and spiders while the western and eastern bluebirds drop to the ground more suddenly. In fall and early winter, bluebirds turn to berries for nourishment. Insects constitute 63% of their diet, berries make up 30%, and spiders make up the remaining 7% of their diet.

The bluebird is a territorial bird. The male selects a piece of earth and sky and stakes his claim. He flies within its boundaries, calling, searching, and waiting for a mate to discover him.

When a female bluebird responds to his calls, the two seek a safe, protected niche to raise a brood of young. The pair prefers a nest box or similar kind of cavity. The western bluebird favors ponderosa pine stands, while the mountain bluebird needs an open area.

After the female has approved the nesting spot, she begins to gather grass for the nest. She makes numerous trips as the male watches and guards their new home. As a guard, the male bluebird is an indirect but important participant in the nest-building process.

After one week of nest-building and preparation, the female lays her eggs, one per day until she has a clutch of four to six pale blue eggs. To ensure that all eggs will hatch on the same day, the female does not begin incubating the eggs until they all have been laid. Incubation takes approximately two weeks.

During the three weeks the juvenile bluebirds are developing and growing, the parents bring 3,000 to 4,000 insects to the nest. After approximately 18 days, the juvenile birds are ready to take flight. Fledging from its nest, a bluebird has not yet tested its wings. Its head pokes out of the nest and retreats, out then back, like a child trying to gather courage at the edge of a diving board. A bluebird's initial flight also signifies the final time in the nest. From that point, the fledgling quickly becomes self-

Montana is one of the few states that hosts all three species of bluebirds: western, mountain, and eastern.

sufficient.

After the entire brood has vacated the nest, the family migrates to a new area where the parents begin the nesting process again. In Montana, a pair of bluebirds usually raises two broods, but rarely a third.

Mortality is high during the first year of life, then stabilizes. Few live beyond 4 years, although one bluebird was known to reach the age of 9.

Bluebird migration habits carry them to southern states in late fall and usher them north again in early spring. An early-to-come, late-to-leave habit threatens the bluebird with early fall or late spring cold fronts.

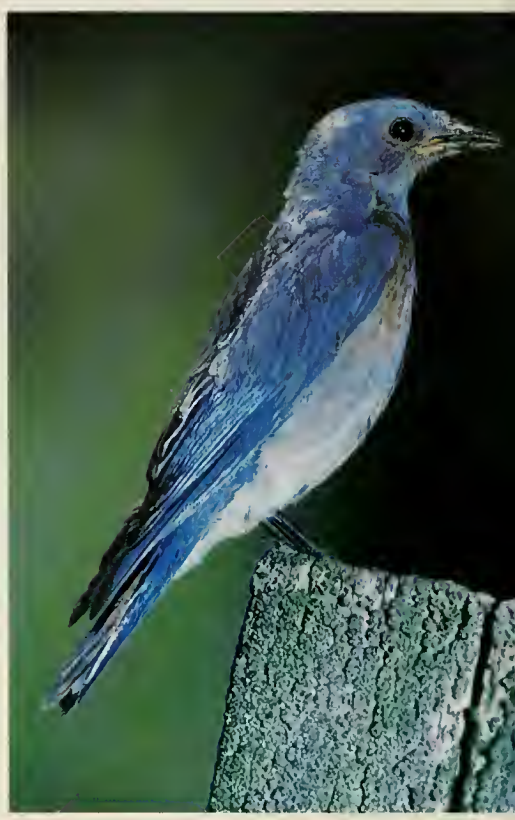
The Decline

North American bluebird populations declined in the 20th century, and ornithologists and bird historians can only speculate and theorize about the reasons. The most popular theories center around three possibilities. Some feel the bluebird was overpowered by bullying nest competitors, the English sparrow (introduced in 1853) and the European starling (introduced in 1890). Others believe that the clearing of deadfall and many landowners switching from wood to metal fence posts drastically reduced nesting sites for all cavity nesting birds, particularly bluebirds. Still others profess that increased use of pesticides and chemicals has resulted in subsequent bluebird poisoning.

It's hard to speculate about the status of past bluebird populations because it is not known how many bluebirds inhabited Montana before 1920. Also, there is no way to determine how many bluebirds the state normally accommodates. What we do know, however, is that 50 years ago bluebirds were scarce on the Big Sky landscape. Today, with restoration efforts, we can tell an amazing story of how the bluebird rebounded.

The Comeback

Through individual interest and promotion, the crisis of the bluebird became nationally recognized. The eastern and western bluebird were placed on the



TOM J. ULRICH

Male western bluebird.

National Audubon Society's Blue List in 1972 and 1978-1982 (the Blue List identifies regional bird populations in North America in danger of population decline). With the listing of the eastern and western bluebirds, bird-watchers, conservationists, and other private citizens were alerted that North America was in danger of losing these precious gems. Concerned citizens heeded the warnings and answered the call literally with their own hands, through the construction and placement of simple, yet what have proved to be amazingly effective, recovery tools—bluebird nest boxes.

Before 1974, only a few bluebirders in Montana maintained nest boxes. Yet even though the number of fledglings was minimal, it was sufficient to see Montana through a critical time when the state was in danger of losing bluebirds.

In 1974, Art Aylesworth, a nationally known bluebirder dedicated to the bluebird conservation cause, and other bluebirders placed 1,500 nest boxes in the Ronan area. Despite efforts, the number of fledglings those boxes produced that

ED TYANICH

Male mountain bluebird.

TOM J. ULRICH

Male eastern bluebird.

year was zero, and only five bluebirds were reported to have fledged from nest boxes in the entire state. By 1977, that number had increased to an encouraging 91, and by 1978 it had almost tripled to 275. Since then, the trend of bluebird recovery has risen constantly in proportion to the number of new nest boxes placed.

Bluebird conservation continued to gather support with the founding of bluebird organizations. In the East, the National Bluebird Society was founded in Silver Spring, Maryland, in 1978. As stated in its mission statement, the society is dedicated to increasing the population of all three bluebird species that live in the United States. In the West, Mountain Bluebird Trails, founded in 1981, exists as a loose-knit organization that collects information and coordinates bluebird observations from members. The organization includes members from Alberta, Washington, Idaho, Nevada, and Montana. Anyone who keeps a bluebird nest box and regularly monitors its use is welcome to join. The organization has no bylaws and no dues; for more information contact Aylesworth at P.O. Box 794; Ronan, MT 59864, or Deni Hershberger, 439 River Road West; Plains, MT 59859.

The Department of Fish, Wildlife & Parks also offered support for Montana's bluebird recovery program. During 1979 and 1980, the department evaluated the status of the western bluebird in Montana. By 1983, department biologists could document that the western bluebird was expanding its range.

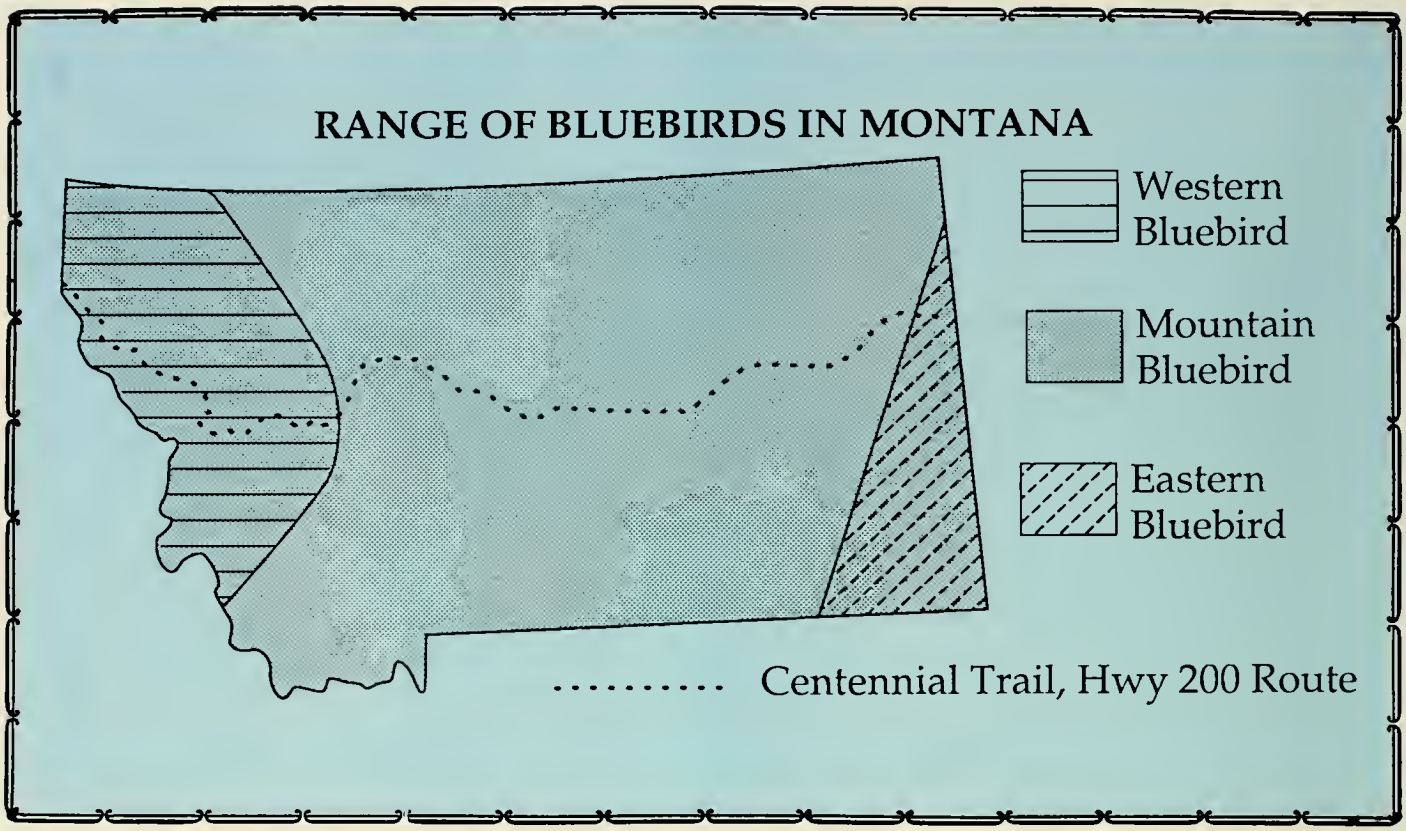
Dennis Flath, FW&P's nongame program coordinator, commented that "the western bluebird experienced a very depressed population level a few years ago. Now it has recaptured some of its original range." Although Flath sees the western bluebird study as the department's most important contribution to bluebird conservation, the department has also helped the bluebird recovery cause in other ways. Over the years, he noted, the department has donated materials for nest box construction, distributed nest box blueprints, and encouraged public involvement in bluebird conservation.

In 1984, just 10 years after the push to save Montana's bluebirds began, the number of fledglings stood at 5,224. In 1988, the number peaked at 10,300. In 1989, however, the first decline of bluebird fledglings in recent years—the final count was 8,096—was recorded.

Bluebird expert Aylesworth believes the 1989 decline could have stemmed from specific weather patterns that affected the birds' migration. "Bluebirds were flushed from the southern climates by unusually hot weather one month to six weeks prematurely," he said. "This forced them into the snow and frozen snow areas, as well as late winter storms, all through the northern part of their breeding range." Oregon, Idaho, and Washington also experienced heavy bluebird losses in 1989.

But Aylesworth noted climate changes and natural disasters affect the natural habitat patterns of all living organisms. "It's natural. We shouldn't be too concerned," he said, "because it's going to happen."

Luckily, the bluebirds bounded back in 1990—the largest fledgling year yet at 15,773. The figure is not only a



record for Montana, but also a record for the nation.

Over the past 20 years, the bluebird nest box program has improved bluebird population levels all across North America, especially in Montana. Some people oppose the use of nest boxes because they see them as artificial conservation devices. But Aylesworth disagrees, because all nesting birds benefit from boxes. "As we improve the number of bluebirds," he explained, "we are also increasing numbers of tree swallows, nuthatches, and violet-green swallows. I don't think we're making bums out of bluebirds...." Nest boxes, he emphasized, merely provide a habitat component—a place to nest—that has become increasingly difficult to find amidst development and competition from house sparrows and starlings.

Bluebird Trails

The most effective way to attract bluebird pairs is to establish a bluebird trail. A bluebird trail is a series of nest boxes (at least four or five) placed approximately 100 yards apart. Placing boxes in a series facilitates monitoring and provides added protection for the birds. Boxes sometimes have been placed back to back to accommodate use by both bluebirds and tree swallows at a single location.

In 1987, Aylesworth and FW&P's Flath initiated a bluebird trail project that brought bluebirds to the forefront of Montana's 1989 Centennial activities. Along a 650-mile stretch from Heron on the state's western border to Sydney on its eastern edge, bluebirders placed four to five boxes per per mile along U.S. Highway 200. The Centennial Trail, comprising a total of 3,500 boxes, was completed in time for Montana's 100th birthday celebration.

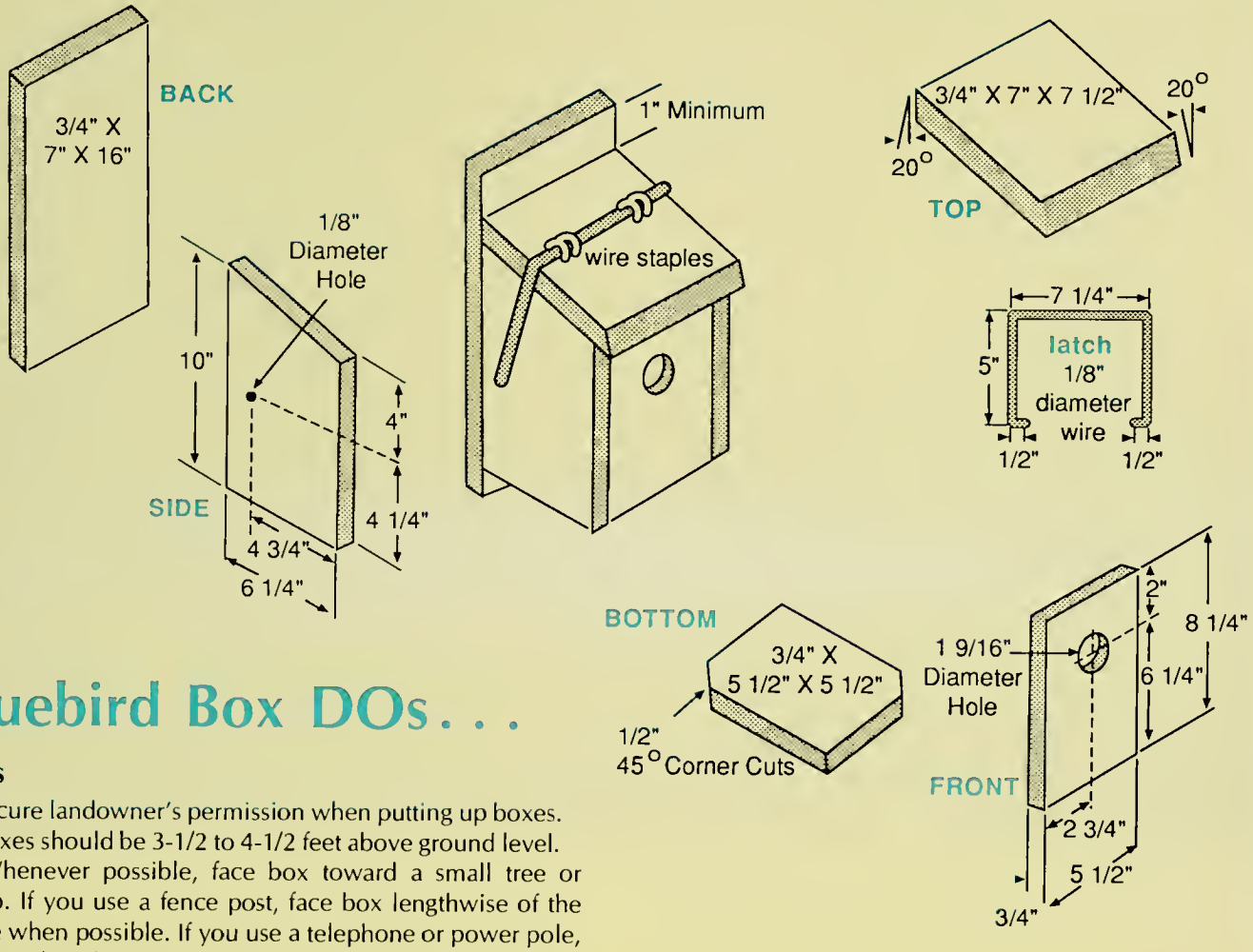
Aylesworth and Flath engineered the Centennial Trail with the belief that it would promote Montana's bluebird recovery program. With a statewide campaign, they anticipated that the Centennial Trail concept would attract the interest of more birding enthusiasts. "Exactly what we hoped for happened," remarked Aylesworth, and the state's bluebird campaign continues to grow.

In order for bluebird trails as well as entire nest box programs to be as successful as possible, it is imperative that box owners keep track of the progress of their brood(s). Monitoring the boxes is necessary for both record-keeping and for health of the brood. Box owners should clean out the box after each brood has fledged, and at the very least once a year. This will encourage a new pair of bluebirds to nest as well as ridding the nest of any larvae or invading insects. Also, by reporting the number of fledglings a box produces, the state is able to maintain an accurate count of how nest boxes have improved populations of bluebirds in Montana.

Obviously, nest boxes are making a vital contribution to the bluebird's successful recovery. But nest box monitors also realize benefits. Observing nesting bluebirds throughout the spring and summer is a rewarding and fulfilling project. All ages receive rewards, as both children and adults learn firsthand about the miracles of nature while contributing to bluebird conservation. There is potential for learning, discovery, and, above all, for participation in bluebird recovery.

According to Aylesworth, nest boxes are "man's interference in the overall scheme that has allowed recovery." It's one of the few examples in which nature is supported and helped—if not saved—by man's direct contact and involvement. ■

BLUEBIRD HOUSE PLANS



Bluebird Box DOs . . .

DOs

1. Secure landowner's permission when putting up boxes.
2. Boxes should be 3-1/2 to 4-1/2 feet above ground level.
3. Whenever possible, face box toward a small tree or shrub. If you use a fence post, face box lengthwise of the fence when possible. If you use a telephone or power pole, face box lengthwise of the lines. This establishes perch sites for the male when the female is brooding. Ideal distance from the box to perch is five feet to 100 feet. Face box away from prevailing winds.
4. If available, use fences near or above cliffs and clay banks along streams and rivers. These areas may have natural nesting bluebirds that will respond quickly to the boxes.
5. Place boxes in shortgrass areas; bluebirds forage on the ground to secure food for their young.
6. Use areas such as summer homes, cabins, or yards in rural areas if the occupants do not have cats. Bluebirds like people, especially children.
7. Use singleton trees far enough from dense stands of trees to avoid depredation by squirrels.
8. For experimental trails, place four or five boxes per mile. If successful, you can add more boxes to increase the trail. Never place boxes closer than 100 yards from each other. Numbering boxes makes record keeping simple.
9. Clean boxes out after each fledge if possible, or at least each fall to avoid mites and fly larvae attacking young birds.
10. Monitor the boxes about once a week during nesting season.

. . . and DON'Ts

DON'Ts

1. Do not place boxes near thickets of thorn apple, chokecherry, or wild roses; also avoid the juniper clumps found in drier areas of the state because they are house wren habitat and house wrens destroy bluebird nests.
2. Do not place boxes near summer fallow or wheat crops because there is no food available and there is the danger of spray.
3. Avoid fence posts with braces running to the ground because weasels and chipmunks can readily run up to the nest box.
4. Avoid heavily timbered areas and areas with heavy ground cover.
5. Avoid areas close to stagnant ponds and swampy areas. Tree swallows will inevitably claim the houses.
6. Do not place boxes near farm buildings or feedlots because of cats and sparrows. Boxes should be at least 1/4 mile away from these areas.

MONTANA MARDI GRAS

by Channing W. Welin

CHANNING W. WELIN

It wasn't until the middle of February that a week-long chinook cleaned out the ice jam. I immediately began yearning for a mid-Yellowstone River trip and a dozen co-conspirators came to mind. But the vagaries of weather clouded that plan. I elected to take a duck-dog companion, a minimum of camping gear, and plain food.

On Tuesday, February 27, retired Big Timber dentist and venerable angler, John Herries, drove me and black Lab, Keg, to the usual launching.

It is one of those rare mornings, cloudless, temperature in the 30s, but it feels warmer (no wind). At first, rowing in the flotation vest seems awkward, but considering the facts, it is foolish to do otherwise.

Some of the rainbows may be moving to the redds, and in my mind I have the plan for prospecting with deeply sunk streamers. The first stop is an old standby just below the confluence with the Boulder. In knee-deep water and five casts later, my left foot is noticeably colder than my right. Suddenly two or three days of rainbow chasing has come to an abrupt halt. Anyway, cloudless days are not known as good producers of rainbow trout.

I row downriver to a brushy mid-river bar for a foot-warming picnic. Last July's high water dropped a long cottonwood log left smooth by the June floods. For a while trout fed and rested against this log. Today it is mine, with one difference: The trout covets the shade and I bask in the sun. The parading birds fly close as their feeding period ends. Goldeneyes and common mergansers are announced by their wings. Canada geese and belted kingfishers are vocal; the mallards just appear. With spring near and in the noon sun they are bright and grand in breeding plumage.

Camp comes early and far upstream of the plan. The Crazy Mountain view, memories of rising trout, decoying ducks, and hopes for Wednesday morning stop me at Chuck's Island.

Under the crescent moon the unneighborly geese have spasmodically hub-ronked throughout the night. Frosty air has seeped into the sleeping bag

MICHAEL H. FRANCIS

Goldeneye.

and sleep is fitful. The whistling wings of goldeneyes in flight mean it must be first dim light of Wednesday. The next half hour will not be pleasant; it will start with a hoarfrost shower as I emerge from bag and tent. I have been through this drill many times and it is still a challenge until the campfire comes to rescue me.

Just as the first hint of sun is on the Crazies, I grab the camera and scurry to other spots. The quality of the scene and the light have a profound effect on me, yet cold fingers reluctantly operate the camera. It is like chasing the wind; a Robert Bateman or a Clyde Aspevig can put the poetry of the moment on canvas. It will escape my feeble attempts at photography.

The numbness of the restless night melts away next to the campfire, coffee, and fried hash. At this time the first two float fishers appear; farther upriver I see three more. Respectfully, they paddle across the river, apparently unsure of the proper behavior. More drift into the same eddy, behaving like the guys at a junior prom. There is courage in numbers so the leader takes flight and about a dozen shining black and white goldeneyes brazenly fly within 20 yards of my campfire. No conservationist, a whining Keg grieves at their passing.

It's 8:30 a.m. on Ash Wednesday, and the majesty of the morning is gone. A day-long party is over. The celebrants sang their loudest and wore their finest: the resonant rhythms of the geese and the after-five wear of the goldeneyes and mergansers. Belted kingfishers, Bohemian waxwings, and chickadees added ambiance. Above all, a solo, soaring bald eagle presided.

This can be yours. Near, but not in, a long trout-stream riffle—stop, close your eyes, then earnestly listen: The river claps its hands! How appropriate at the end of my Montana Mardi Gras.

MIKE LOGAN

Canada geese.

Restoring Wetlands on Private Lands

by Jim Stutzman

JIM STUTZMAN

The Private Lands Program has spent about $400,000 on wetland restoration in Montana since 1988. More than 500 wetlands totaling 2,500 acres have been restored to date.

It's an unusually busy morning at the local cafe. A week of steady rain across Montana's Hi-Line has given farmers and ranchers a temporary break from field work. Folks are taking advantage of the downtime to drink a cup of coffee with a neighbor and chat about the local news. Most of the conversations involve agriculture—grain and livestock prices, farm policies and, of course, the weather.

Eventually another subject surfaces. A long-time resident of the county casually mentions that a biologist from "Fish and Wildlife" has asked him about restoring some washed out reservoirs and drained sloughs on his farm. The idea is to improve private land for ducks. The program sounds interesting but he is somewhat skeptical about a cooperative venture with government.

The farmer is curious if anyone else has participated in the program. He is somewhat surprised to learn that the U.S. Fish and Wildlife Service recently repaired three small stock dams for a close neighbor. The neighbor was also leery about the program, but in the end decided to sign up. He tells everyone gathered at the table that it was the right decision. After all, it didn't cost him anything, and he can always use more stock water, not to mention the fact that his wife enjoys seeing a few ducks and geese on the place.

WHY PRIVATE LANDS?

The above conversation may sound far-fetched, and it never would have occurred five years ago. Until recently, wildlife agencies were either unable or unwilling to consider wildlife projects on private land. Habitat improvement projects were confined to public land and private land was off-limits. Fortunately, things have changed. Wildlife professionals now understand that resource conservation cannot be limited to public land. They also realize that tremendous opportunities exist for enhancing wildlife habitat *and* promoting stewardship on private land.

There are a number of reasons for the changing attitudes about the importance of private lands to wildlife populations. Let's look at the current situation facing waterfowl. State and federal wildlife agencies have been acquiring, managing, and enhancing public lands for waterfowl for 50 years and yet duck populations in the 1980s dropped to the lowest levels ever recorded. Despite all the productive waterfowl projects on public land, duck populations have continued to fall.

Why are ducks in trouble? The answer, in part, has to do with private land use. The ongoing conversion of important wetlands and grasslands to cropland has been a major factor in duck population declines. Between 1950 and 1985, it is estimated that more than 15 million acres of wetlands were destroyed in this country. More than 85% of these conversions were for agricultural purposes.

Clearly, modern agriculture has adversely affected the quality of waterfowl habitat on private land. It's also readily apparent that nesting ducks and intensive agriculture do not often mix, but the situation is not hopeless. Drains in wetland basins can be plugged, leaking stock dams can be repaired, and prairie grasses can be re-established on poor-quality cropland.

Wildlife agencies now realize that habitat improvement on private land can play an important role in the recovery of the nation's duck populations. This article describes how a U.S. Fish and Wildlife Service (USFWS) effort called the Private

JIM STUTZMAN

Cinnamon teal (left). Yellow-headed blackbird (above).

Lands Program is seeking to improve waterfowl habitat in Montana.

THE 1985 FARM BILL

The Private Lands Program began in 1988, but an important piece of legislation from 1985 actually provided the "window of opportunity." That legislation was the 1985 Farm Bill. The bill contains a number of important conservation provisions, including the Conservation Reserve Program (CRP). Under this program, farmers voluntarily take highly erodible cropland out of production and agree to establish permanent grass cover for a 10-year period. In return, they receive an annual rental payment. Approximately 2.7 million acres of marginal cropland have been enrolled in CRP in Montana. One of the side benefits of CRP is improved wildlife habitat on private land.

The bulk of Montana's CRP acreage is located along the Hi-Line. Because this part of northern Montana contains large numbers of prairie wetlands, reservoirs, and stock dams, it is prime waterfowl production habitat. To be successful, breeding ducks need good-quality upland habitat for nesting *and* wetland habitat for rearing their young. The CRP program set the stage for improving waterfowl production on these private lands through wetland restoration and enhancement.

The USFWS began approaching Montana farmers and ranchers about restoring drained wetlands, repairing washed-out stock dams, and enhancing other wetland areas. The response was overwhelming. Landowners were eager to participate in the program. In fact, many farmers readily admitted that the decisions to drain wetlands and sodbust fragile prairie were costly mistakes.

HOW DOES THE PROGRAM WORK?

The Private Lands Program is administered by USFWS Wetland Management Districts in Great Falls, Lewistown, Malta, and Medicine Lake. Biologists from these field stations are responsible for landowner contacts, on-site inspections, and biological monitoring. These offices also coordinate all construction activities.

Cooperating landowners are crucial to the success of the program, and the USFWS uses a variety of means to attract their interest. News releases, mailings to CRP enrollees, and leaflets have all been used to spread the word. Word of mouth, however, is perhaps the most important source of new projects. Other government agencies like the Montana Department of Fish, Wildlife & Parks, the Soil Conservation Service, and the Montana Department of State Lands have also been helpful in referring projects to the USFWS.

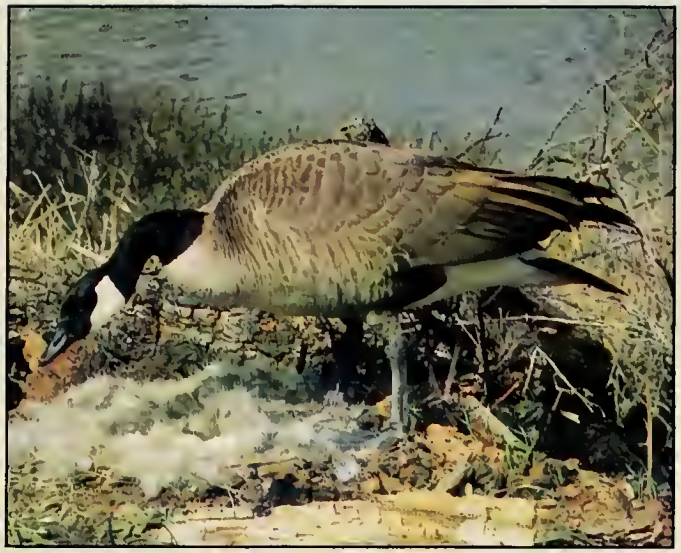
Potential projects are evaluated with an on-the-ground inspection, review of aerial photos, and landowner interview. Projects providing the greatest waterfowl benefits rank highest. The program emphasizes:

- Natural wetland restoration (drained sloughs, potholes).
- Small stock dam and reservoir restoration.
- New stock dam construction.
- Nesting island construction.
- Artificial nest structures.
- Cost-sharing on CRP seedings.
- Reservoir fencing.

One of the most attractive features of the Private Lands Program is that it seldom costs the landowner money. Natural wetlands and small stock dams or reservoirs are typically restored at *no cost* to the landowner. For larger projects, cost-sharing is available.

A number of options exist for completing the actual construction work. In cases where the landowner owns heavy equipment, he may be hired to do the repairs. Hiring a local heavy equipment contractor is another alternative, or the USFWS may use its own manpower and equipment to complete a project. Construction activities are closely coordinated with the landowner to guarantee that all work is satisfactory.

One major concern of interested landowners involves the question of access. A landowner retains control of all access to



STEVE WIRT

Canada goose.

the project. Reasonable access to a restored site for hunting or other recreation is encouraged, but the landowner makes that decision.

Red-tape and paperwork are minimized. Landowners participating in the program must sign a wildlife extension agreement. This three-page document gives the USFWS permission to enter the property and spells out any special provision in the agreement. The length of these agreements varies, but they typically average 10 years. All culverts, water control structures, or other construction materials become the landowner's property once a project has been completed and the extension agreement expires.

ACCOMPLISHMENTS

At the outset, we were uncertain how the Private Lands Program would be received. Would landowners be willing to enter into a cooperative agreement with the federal government when the objective was improving wildlife habitat? Initial concerns about landowner participation quickly disappeared. We found that many landowners were deeply concerned about wildlife and wildlife habitat, and were eager to cooperate.

Over the past three years the Private Lands Program has spent about $400,000 in Montana. The budget increased from $50,000 in 1988 to about $250,000 in 1990. More than 500 wetlands totaling 2,500 acres have been restored during this period. Other accomplishments include construction of 25 nesting islands, cost-sharing assistance on 8,000 acres of CRP land, and placement of 125 artificial nesting structures on privately owned wetlands. Approximately 150 landowners, primarily farmers and ranchers, have participated in the program, and projects have been completed in 21 Montana counties.

Some of the benefits of these projects to wildlife are worth reviewing. In the spring of 1990, USFWS employees counted 171 breeding pairs of ducks on 18 restored and new reservoirs in Fergus County. Mallards were the most abundant ducks, followed by wigeon, blue-winged teal, and pintails. Total annual waterfowl production for the 18 reservoirs was estimated at over 725 birds! If the average life of a reservoir is 25 years, that means 18,125 ducks will be produced on these 18 ponds.

While duck production may be the underlying reason for the Private Lands Program, a variety of other wildlife species benefit as well. These wetlands become a focal point for a variety of wild creatures. Upland game birds as well as deer and antelope prosper on CRP lands. Nongame species, from spring peepers to golden eagles, also benefit from availability of water on CRP tracts.

While many landowners are willing to proceed with a project purely for the benefits to wildlife, they often receive some tangible economic benefits as well. In the case of stock dam restoration, the increased water will distribute livestock use more evenly through a pasture. Most natural potholes and sloughs in Montana are very shallow and seldom hold water all year. They provide water for spring pasture and produce substantial amounts of forage. Sloughs are also good hay producers, especially in drought years.

LONG-TERM BENEFITS

What happens after wildlife extension agreements with landowners expire? We cannot predict the future, nor can USFWS dictate future land use, but we will probably direct our efforts toward landowners who are interested in changing the long-term uses of their property.

For example, leaving a grassed waterway and a small stock dam between two fields may take 15 to 20 acres of cropland out of production, but the long-term benefits should far outweigh the lost production. Such areas are typically hard to farm, and may be subjected to increased erosion. Creating a balance between wildlife and agriculture is not easy, but it can be done. It does, however, require a commitment to land stewardship on the part of the landowner and a willingness on the part of wildlife agencies to help strike the balance.

THE FUTURE

The future looks bright for expanding the Private Lands Program in Montana. Funding has risen steadily over the past three years, and we expect this trend to continue. Landowner participation has also continued to grow. Landowners, recreationists, taxpayers, and wildlife all benefit from the program.

Cooperation between private landowners and wildlife professionals will become increasingly important as we approach the year 2000. Encouraging private land stewardship is an old idea whose time has come. Restoring habitats and developing a strong land ethic will ensure that Montana's wildlife populations are sustained for future generations.

If you are interested in participating in the U.S. Fish and Wildlife Service's Private Lands Program, contact: Jim Stutzman, Bowdoin National Wildlife Refuge, P.O. Box J, Malta, MT 59538; 406/654-2649 or 654-2863.■

• *The author would like to thank Mike Getman, assistant manager, and Clarke Dirks, biological technician, Bowdoin National Wildlife Refuge, for their help with this article.*

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